

1983

Technology, education, and social change: a programme for survival

N. C. Mitchell
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Recommended Citation

Mitchell, N. C., Technology, education, and social change: a programme for survival, Master of Arts thesis, Department of Education, University of Wollongong, 1983. <https://ro.uow.edu.au/theses/2162>

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TECHNOLOGY, EDUCATION, AND SOCIAL CHANGE

A PROGRAMME FOR SURVIVAL

A thesis submitted in fulfilment of the
requirements of the degree of

MASTER OF ARTS

from

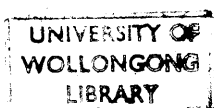
THE UNIVERSITY OF WOLLONGONG

by

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DEPARTMENT OF EDUCATION

1983



784980

SUMMARY

The thesis sets out to recommend a curriculum and a method of school organisation which would be relevant to the requirements of the school pupils of today and the near future. The suggested curriculum is to involve the integration of environmental studies with each of the subject areas studied at school. The graduated development of democratic procedures is recommended for application in schools in order to develop abilities in, and habits of responsible decision-making in the maturing young.

It is maintained that the adoption of these measures would be likely to produce citizens who would not only understand the urgent problems involved in the survival of the human race in the face of pressing environmental deterioration, but would also be capable of taking dynamic action in the community in order to ensure the application of correct environmental principles.

The thesis is based on a survey of the influences of philosophical idealism, both past and present, on both society and education; this survey is undertaken in order to trace the channelling of thought that results from a pervasive but often unexamined system of philosophical belief. The relationship between idealism and environmental degradation is discussed.

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INTRODUCTION

In 1980 Hutchinsons published for the prolific writer, Isaac Asimov, a book entitled A Choice of Catastrophes. The Disasters That Threaten Our World. Asimov dealt with five classes of catastrophes: (1) the entire universe might so change its properties as to become uninhabitable; (2) something might happen to the sun that would spell our doom; (3) the earth itself might undergo the kind of convulsion that would make life impossible on it; (4) something (perhaps man-made) might destroy human life on earth; and (5) civilisation as we know it might be destroyed.

Obviously there is nothing that we can do to prevent the occurrence of the first three types of catastrophes. Possibly also we are doomed to suffer, quite inevitably, catastrophes of the fourth and fifth type - maybe because of some serious fault in man's brain, as suggested by Arthur Koestler (see Chapter 1). Possibly the end of the human race will, in fact, be signalled by the riding of the Four Horsemen of the Apocalypse: Starvation, Disease, Violence, and finally, Death. There is no shortage of doomsday literature, books written not in the science-fiction genre, but sober books from authoritative writers.

Thus mankind may be at a crisis point. It may be that the advance

of 'big' technology, with the using up of materials dug out of a finite earth's crust, the production of a vast range of toxic industrial and nuclear wastes, the inadvertent development of new diseases in the course of genetic experimentation, or the final catastrophe of nuclear war, will cause mankind to join other species which have become extinct. But there may be time available to change the prognosis of doom, to design and produce an environment, both social and physical, in which mankind may survive. It is a theme of this thesis that it is urgently necessary to devise a curriculum for schools that will make the youth aware of the environmental problems facing the world. It is also urgently necessary to change the organisation of schools so that there may be produced citizens who, because of their school training, would be capable of taking dynamic action in the community in order to ensure that correct principles are applied.

The basic necessity underlying such prescriptions is that both the young and their elders should discard the centuries-old habits of thought that are based on the ideas of philosophical idealism. Thus they should understand that man is just one of the living creatures on earth, an integral part of nature, not **superior to it**. It is necessary for man to co-operate with nature, not try to 'conquer' it; otherwise man dies. Accordingly a section of the thesis has been devoted to a consideration of early philosophical idealism and the legacy of thought it has passed on to the modern world.

The scope of the work is restricted to consideration of what is usually known as the "Western world", consisting of relatively highly industrialised nations whose philosophy has been largely based on a Judeo-Christian tradition. No consideration has been

given to specific problems of the "third world". In particular, the recommendations of the final part of the work are concerned with Australia. Furthermore, the work is restricted to a consideration of schooling; it does not extend into the post-secondary field of education. Whenever the term 'education' is used, this should be read as referring to education within the primary and secondary school systems. A further limitation should be noted. In Chapter 8, in which recommendations are made for the adoption of a curriculum woven integrally around environmental matters, no attempt is made to set out such a curriculum in detail, for reasons that are clearly given in that chapter.

The writer is uncomfortably aware of a difficulty with the use of the English language. That is, no one seems to have devised a satisfactory series of gender-neutral words to refer indifferently to persons of both sexes. Consequently the terms 'he', 'his', 'man', 'mankind' will be used throughout, in order to avoid the clumsiness of writing 'he and/or she', 'his and/or her', 'man and/or woman', 'mankind and/or womankind'. In each case, unless clearly revealed by the context, it is intended that the masculine term should be read as referring equally to both males and females.

An education system relevant to our world would be one which is designed to produce people who can understand the most pressing problems of our civilisation, and who have gained experiences which have equipped them to cope with these problems. It is the main task of this thesis to put forward the characteristics of an education system which may produce this result.

In the course of the work attention will be paid firstly to a consideration of various characteristics of our present world -

a setting-out, briefly, of some of the problems requiring most urgent attention, problems the solution of which will determine the quality of life of children currently in school. In the words of the chapter heading, we will survey "What kind of world?". The next four chapters deal mainly with historical processes which may throw some light on the path that Western civilisation has traversed on the way to our present world situation; and with the philosophical idealism which, it is contended, has significantly shaped the thinking of modern man. In other words, we consider the questions: "How did we get to where we are, and why was that path taken?" Great importance is attached to the long-standing and often unrecognised ideas which underpin the attitudes and activities of our Western society. Examples are given, both in the wider context of society itself, and in the more restricted field of education, of such attitudes and activities, both as they have been seen in times past, and as they are seen in the lives of twentieth-century man.

Chapters 6 and 7 move from considerations which have been mainly based on the past, to a noting of some future possibilities. In Chapter 6 suggestions are made concerning a possible organisation of society, and, in parallel, of education, which could be accepted as an alternative to our present societal arrangements, based as they are on consumerism and a large degree of technological determinism. Such an alternative society has been termed a 'sustainable', or a 'frugal', or a 'no-growth' society. The subsequent chapter sets out some characteristics of a society taking the opposite path, that is, one which could lead to the domination over man of 'big' technology. Some of the implications for education are noted.

Chapter 8 considers, as a conclusion to all the foregoing matters, the characteristics of a school curriculum, and of school organisation

which, it is contended, would help meet the goal set out at the beginning of this chapter, with the production of responsible, responsive, active, confident, understanding citizens who would be equipped to tackle positively the awesome problems facing mankind. Some of the goals of such education are set out in Section C of the material in Appendix III. Chapter 9 presents a brief conclusion to the work, and is followed by three appendices and a bibliography.

In recent years some of the matters considered in this thesis have, indeed, received some attention. The contention is made, however, that many such studies have been superficial; the deeply-rooted causes of misdirections and deficiencies in our education system have been ignored. Proposed solutions have therefore tended to be such that their application would not lead to the removal of these deeply-rooted causes. To use a geological metaphor, little drilling has been done to explore and map the deep lode of the problems; attention has been concentrated on the fortuitous outcroppings at the surface.

One example may be mentioned: the "Williams Report". Under the title Education, Training and Employment, this report of the Committee of Inquiry into Education and Training was presented, in three volumes, to the Australian Federal Government in February 1979 after nearly two and a half years of study, interviewing, discussing, collecting and collating data ¹. The report referred to roles of

1. B. Williams (chairman), Education, Training and Employment. Report of the Committee of Inquiry into Education and Training, 3 vols., Australian Government Publishing Service, Canberra 1979

education up to the year 2000. Much of the material dealt with post-secondary education, but matters connected with secondary schooling were referred to in some detail. That the work was superficial was noted by the Chairman of the Humanities Department of the Footscray Institute of Technology. "The Report", he said, "contains no insights into the nature of education or its function in the life of society" ². The Chancellor of Macquarie University noted that the greatest difficulty he had in commenting was that, although he could disagree with little that was in the report, yet "there is not a great deal that is both novel and important" ³.

The Report was not based on any consideration of the origins of present difficulties, either educational or societal. Without such a consideration it is difficult, if not impossible, to discern the channelling of thought that results from a pervasive but often unexamined system of philosophical belief. It is in an effort to avoid the superficiality of such reports that this thesis is based on an examination of the origins of beliefs and value patterns which are influential in the "Western world". It is not considered that a sound basis for developing a desirable and relevant education system may be achieved by considering only the present appearance of that system, and by putting forward only the mechanics and techniques of change. In order to build a system suited to the tasks presented

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2. J. McLaren, "Encyclopedia of Trivia", Vestes. The Australian Universities Review, Vol. 22 No. 2, FAUSA, Melbourne, 1979, p. 12
 3. P. H. Partridge, "A Non-Controversial Report", ibid., p. 8

by today's world, it is necessary to focus on reasons for changing the deep-rooted assumptions from which spring not only societal activities but also their associated educational activities. From this basis there may be put forward methods of producing citizens who have the ability as active members of a dynamic democratic community, together with the necessary knowledge and experience, to cope successfully with the operation of an advanced-technology world, so that man will not be subservient to, or crushed by, the operations of such technology, but will use technology to improve the quality of life of mankind.

1.1 A rosy view

A realisation of the gravity of abuses in the new technological age is a comparatively recent phenomenon. As Georgescu-Roegen notes, "...when everyone (in the countries with "bigger and better" industrial production) was, literally, hit in the face by pollution, scientists as well as economists were taken by surprise" ¹. Attention to such a problem needs to play an integral part in any modern educational system. Such consideration will be referred to in more detail in Chapter 8. With the belief now being propagated in many quarters that the degradation of man's environment is reaching crisis level, "...in a crisis it must be foolhardy in the extreme to leave to mere chance the likelihood of our young people receiving the education which will enable them to understand and deal with manifestations of that crisis" ².

Such ideas are of fairly recent origin. Georgescu-Roegen's reference to the mental unpreparedness of scientists is supported by an examination of 'futurology' science books published at least up to the middle 1960s. Common features of such books were: the presentation of a most rosy view of the future in conditions of unceasing increase in the production of material goods, under the benevolent guidance of scientists and technologists, and the apparent absence of any awareness of such a matter as 'pollution' - this is shown most readily by the complete lack of any references, in the indexes of these books,

1. N. Georgescu-Roegen, "Economics and Entropy", The Ecologist, Vol. 2, No. 7, July 1972, p. 16

2. B.O'Neill, "Environmental Education in Australian Schools", in J.Evans and S.Boyden (eds), Education and the Environmental Crisis, Australian Academy of Science, Canberra, 1970, p. 47

to this topic ³.

1.2 Industrial and economic growth

Since the beginning of science and economics studies in the schools (and institutes of higher learning) the idea has been so ingrained that man can 'conquer the earth', and that man's well-being depends on a never-ending increase of industrial production of consumer items, that the notion of challenging these assumptions is still regarded as unorthodox. The intrinsic assumption of a United Nations study on the world economy, put forward as recently as 1977, was still that indefinitely-sustained economic growth is not only desirable, but also practicable. In fact, in this United Nations study the statement was made that "this study assumed continuing economic growth" ⁴.

This assumption appears to have been adopted also in the courses on economics presented to high school students in New South Wales ⁵. Because of the centuries of teaching that man is superior to nature, people who have spent their lives within a 'growth era' would not find this at all a remarkable state of affairs. Speeches by politicians, both within the Australian Federal Government and in the Opposition, tend to confirm this view. The voters are given the impression that the only desirable aim of government in economic policy is to maintain a large and continuing growth in Gross National Product; and that the absence of, or even a slowing of such growth

3. Exmples include: J. Huxley, Scientific Research and Social Needs, London, Watts, 1934; W. Kaempffert, Science Today and Tomorrow, Viking, N.Y., 1945; A. Low, Science in Industry, Oxford University Press, Melbourne, 1945; I. Asimov, Marvels of Science, Collier, N.Y., 1962; N. Calder (ed), The World in 1984 (2 vols.), Penguin, Middlesex, 1965.

4. W. Leontief et al, The Future of the World Economy, A United Nations Study, Oxford University Press, N.Y., 1977, p. 45

5. Board of Senior School Studies, Economics and Society Syllabus, Years 11 and 12, New South Wales Department of Education, 1970

would represent some kind of disaster. It is only within the last few years, and on the fringe of orthodox economics, that the possibility, even the desirability, of a 'sustainable state' has been once again considered. This matter, together with a note on the relevance of the words "once again" in the previous sentence, will be considered in a following chapter (Chapter 6).

1.3 Lack of co-operation from educational authorities

A weakness in current educational practice may be seen in courses of study other than economics. Science courses such as those studied in Australian secondary schools tend to concentrate on the presentation of purely technical material referring, for example, to the narrow phenomena of chemistry with practically no reference to environmental questions⁶. It is pointed out in the previously-quoted Australian Academy of Science report that what happens in the classroom depends on the understanding and the attitudes of the teachers. Teachers have complained of the difficulty of obtaining suitable teaching and learning materials, and that none of the available syllabuses show recognition of the importance of environmental studies. The State Education Departments are apparently not aware of the magnitude and urgency of environmental problems or of the importance of the role of educators in dealing with them⁷. Evidence for this claim is given by the fact that, although invitations were given to the State Directors-General of Education in all the Australian states to attend the Academy of Science Conference on Education and the Environmental Crisis, not one saw fit to attend, and only three (Tasmania, South Australia and Victoria) sent representatives. Some of the factors

6. B. O'Neill, in J. Evans and S. Boyden (eds), op. cit. Examples are given of syllabuses from all Australian States.

7. Ibid., p. 46

affecting our lives, and which emphasise the urgency of the adoption of some sort of regularised programme in environmental education, are set out below.

1.4 Atmospheric pollution

As a result of man's blind attempts to 'subdue the earth', the biosphere - the soil, air and water on which all forms of life depend - is under continual, and increasing attack. Mankind evolved in an atmosphere which, in the absence of adulteration, consists of nitrogen 75.52%, oxygen 23.14%, carbon dioxide 0.047%, 'inert' gases 1.28%, together with varying amounts of moisture ⁸.

It is reasonable to postulate that people living in an atmosphere significantly different in composition from this mixture will not function at maximum efficiency, and may be affected by impaired health. Yet daily into the atmosphere are injected increasing amounts of other substances which, not being part of man's evolutionary conditioning, must be regarded as pollutants. Many are sharply inimical not only to good health, but even to life itself.

Even the use of commonplace domestic aerosols may threaten man's well-being. The UN World Meteorological Organisation in Geneva has reported that the continued ^{use} of man-made fluorocarbons in such items as hair-sprays, deodorants and other aerosol cosmetics "may lead to a significant reduction in atmospheric ozone", and that a reduction of ten per cent in this ozone would increase ultra-violet radiation reaching the earth's surface by twenty per cent. ⁹. The effects of such increased radiation on unprotected

8. B.Parkes (ed), Mellor's Modern Inorganic Chemistry, rev.ed., Longmans, London, 1963, p. 584

9. New Scientist, Vol. 69, No. 983, 15 January 1976, p. 109

skin would be quite dangerous; its effect on plant life would also be grievous, almost certainly increasing the extent of deserts and thus reducing food production ¹⁰.

It appears uncertain whether the earth's climate is more likely to be affected disastrously by the build-up of carbon dioxide produced from industrial and domestic combustion of carbon compounds or by an increase in the amount of particulate matter in the atmosphere. Carbon dioxide absorbs little of the heat radiation reaching the earth from the sun; it does, however, absorb a major fraction of the longer-wave radiation reflected back from the earth. Consequently an increase in the concentration of carbon dioxide in the earth's atmosphere would tend to reduce the radiation of heat from the earth into space, thus raising ambient temperature - the well-known 'greenhouse effect'. Excessive deforestation in many countries will reduce the removal of the gas from the atmosphere by decreasing the extent of photosynthesis by trees. At the same time there is continual accumulation, at high altitudes, of atmospheric dustiness and turbidity. Possible results of the above-mentioned phenomena include either the raising of average ambient temperature through the 'greenhouse effect', followed by melting of polar ice and consequent flooding of low-lying lands and most of the world's major cities, or the increased reflection back into space by the turbid atmosphere of solar radiation which would thus be prevented from reaching the earth. The latter situation would bring the

10. Australian Broadcasting Commission, TV programme, Channel 2, 2 February 1981.

possibility of the occurrence of a new 'ice age'. In either case the effect on mankind's life and well-being would be extremely disturbing if not actually disastrous.

1.5 Pollution of water

Rivers, lakes, and oceans have long been regarded as 'free goods' (to use the jargon of economics) by industrialists, in that they have been used as freely-available dumping places for industrial wastes, thus degrading the water available for the maintenance of healthy life. An example is mercury, the dumping of which into a nearly land-locked bay at Minamata in Japan in 1953 caused mental derangement and often death with people who had eaten shellfish from the bay.¹¹ Example after example could be found of the pollution of earth's waters. In fact it would be difficult, anywhere in the inhabited world, to find a stream from which water could be drunk safely without some more or less drastic treatment. For example, at Katoomba, New South Wales, near Echo Point, there is a stream plunging in a silvery cascade from a cliff into the valley below. At the head of this visually delightful waterfall there stands a notice: "Danger! Polluted water".

The almost insatiable demand for petroleum products to fuel the world's transport systems and industries is turning the oceans into receptacles for spilled hydrocarbons. With alarming frequency supertankers carrying many thousands of tonnes of hydrocarbons are rammed, or run aground. Malfunctions or disasters with undersea oil-drilling rigs add to the pollution of the seas. A report by

11. B. Ward and R. Dubos, Only One Earth, Deutsch, London, 1972, p.121

an expert group to the Secretary-General of the United Nations in the early 1970s estimated that "2 million tons of oil are reaching the oceans every year despite conventions regulating oil emissions" ¹². Such pollution may well have a devastating and irreversible effect on marine life; this would not only decrease the amount of food available to man, but would also interfere with the supply of oxygen to the atmosphere by inhibiting photosynthesis in marine plant life.

Disposal of radioactive wastes is also threatening the integrity of the water in the oceans. "Britain has dumped 2,300 tonnes of radioactive waste in the Atlantic, a spokesman for the nuclear agency of the Organisation for Economic Cooperation and Development (OECD) said". This boosted the total contaminated material deposited in the ocean since 1967 by eight European nations to 52,000 tonnes ¹³. The practice continues, as witness attempts by members of the Greenpeace organisation, at great risk to their own safety, to prevent recent European dumping, and the recently-expressed intention of Japan to dump radioactive waste in the Pacific Ocean.

1.6 Pollution of the land

With the development of what has been described as the 'throw-away society' and the 'cowboy economy', the land has also become a repository for the end-products of built-in obsolescence and the unwanted waste products of industry. Although the results often tend to be of the nature of nuisances or offences to the aesthetic sense, there are also many occasions when such disposal of material

12. Ibid., pp. 275-276

13. Sydney Morning Herald, 22 July 1977

presents a menace to life. A notorious case was that of the Love Canal area of Niagara Falls. It was reported by the US Environmental Protection Agency that findings of chromosome damage among residents of this area would probably lead to the moving of a further 710 families who have built houses on an old toxic waste dump. This would be in addition to the 239 families previously moved from the dump area, despite soothing words from a spokesman for Hooker Chemicals which, after using the area for years as a dump site for chemical waste, had then presented it to the Niagara School Board as a suitable site for a school and residences. The spokesman said that the Protection Agency's remarks would cause "unnecessary anxiety" among Love Canal residents. It may be doubted that people such as Barbara and James Quimby, whose daughter was born with profound and multiple birth defects, would share the company spokesman's view. It was reported that 21,800 tons of toxic materials, a mixture of 82 identifiable industrial chemicals, of which eleven were carcinogenic, were dumped on to the area by Hooker Chemicals ¹⁴.

1.7 Use of non-renewable resources

Despite the fact that a realisation is beginning to make itself felt that we inhabit a globe with finite resources, the using of non-renewable resources continues at an alarming rate. In considering the sixteen major metals: silver, aluminium, gold, cobalt, chromium, copper, iron, mercury, manganese, molybdenum, nickel, lead, platinum, tin, tungsten and zinc, it has been predicted that

at present rates of consumption all known reserves of these metals will be exhausted within 100 years, with the exception

14. Sydney Morning Herald, 22 May 1980

of six (aluminium, cobalt, chromium, iron, manganese and nickel). However, if these rates of consumption continue to increase exponentially at the rate they have done since 1960, then all known reserves will be exhausted within 50 years with the exception of only two (chromium and iron) - and they will last for only another 40 years! ¹⁵

This assessment was published some ten years ago. Nevertheless, if we take note of the fact that some of the predictions have been criticised as unduly pessimistic, and allow a doubling of reserve figures, this would allow only a relatively few years of extension on the availability of supplies.

Almost (possibly absolutely?) too late there is coming into being an understanding that man, far from being able to master nature, is an integral part of nature, that his continued existence depends, not on his subduing the earth, but on his co-operation with it. The education of people so that they really understand this is a most vital task. Lacking this, all other activities - social, economic, political - may prove to be vanity. Further thoughts on this matter, in its direct relationship with education, will be put forward in Chapter 8.

1.8 Pessimistic views on man's future

While there may be cause for optimism in that arrogance concerning man's position in the fabric of nature shows some signs of diminishing, yet certain disturbing questions arise on this matter. It has been suggested by some that man has already passed the point of no return, particularly in regard to preparations for nuclear war. A

15. The Editors of 'The Ecologist', A Blueprint for Survival, Penguin, Middlesex, 1972, pp. 129-130

few years ago Leo Szilard, who worked with Fermi in Chicago on the development of the first self-sustained nuclear reactor, "estimated the 'half-life' of the human race with respect to nuclear escalation as being between 10 and 20 years". He spoke of strategic gambles, threat and counter-threat, and remarked that "it is easy to see that five or ten more such confrontations in this game of 'nuclear roulette' might indeed give us only a 50-50 chance of living until 1980 or 1990. This is a shorter life expectancy than people have ever had before"¹⁶. We have passed the first point (1980), but still have to reach the second. That such a belief affects the thinking of young people is attested by discussion held with senior high school pupils, many of whom are sadly convinced that a nuclear war will prevent them from living for many more years. Such an attitude must have an influence on their attitude to education, and to the general proposition of deferring present pleasure for the possibility of future reward¹⁷.

An even more depressing view of man's possible future has been put forward. This view, based more on biological considerations than on philosophy, is worthy of mention. If correct, it may make all our efforts to save the human race a vain endeavour. It postulates that man's hereditary factors are such that he will be unable to save himself from extinction unless he adopts drastic measures to alter the operation of his brain. Arthur Koestler puts forward the strong possibility that for this reason the probability of an extended future for man is doubtful. He states that "when one contemplates the streak of insanity running through human history,

16. Noted in J. Platt, "What We Must Do", in J. P. Holden and P. Erlich (eds), Global Ecology, Harcourt Brace Jovanovich, N.Y., 1971 p.281
 17. Interview with Ms. K. Miles, secondary school teacher, Lismore, NSW, 5 February 1981

it appears highly probable that homo sapiens is a biological freak, the result of some remarkable mistake in the evolutionary process..."¹⁸

Koestler puts forward the hypothesis that there may be a serious fault in the structure of man's brain. He notes other examples in nature: the arthropods in which, because the alimentary tube passes through the midst of the brain-mass, the food-tube has been so compressed that "nothing but fluid pabulum can pass through into the stomach", and the marsupials, in which the corpus callosum is missing. The absence of this nerve-tract "seems to have been a principal factor in their arrested development"¹⁹.

In relation to man, Koestler suggests that research seems to indicate that there is insufficient co-ordination between the old and more recently-developed sections of the brain; that there has been "unseemly haste" in the development of the higher parts of the human brain. Instead of the integrated development which might have been expected,

an evolutionary development which gradually transformed the primitive old brain into a more sophisticated instrument... evolution superimposed a new, superior structure on an old one, with partly overlapping functions, and without providing the new with a clear-cut hierarchic control over the old - thus inviting confusion and conflict²⁰.

The 'new brain' deals with thought and verbal concepts; the 'old brain' deals with more primitive 'feelings'. The schizophysiology of the brain, according to this view, provides a clue to the delusional streak in the activities of man.

In considering the extraordinary, sometimes paranoid, often self-

18. A..Koestler, The Ghost in the Machine, Hutchinson, London, 1976, p. 267

19. Ibid., pp. 269-271

20..Ibid., pp. 281-282

menacing activities of mankind, it may indeed seem that "detached, rational thought is a new and fragile acquisition...The old and new levels must interact all the time - even if their coordination is inadequate, and deficient in the controls which lend stability..."²¹. Koestler's solution to the problem does not rest on a system of education. Apparently despairing of the effectiveness of education to establish rapport between the 'old' and the 'new' parts of the brain, he suggests the necessity for using drugs or other chemical treatment to alter the relationship between the two sections of the brain. It is, of course, possible that pharmaceutical and biological knowledge may, some day, be adequate for this task; in the meantime, educators will have to proceed on the assumption, or with the hope, that some less drastic treatment, applied in the field of affective education, may lead to a lessening of the tensions noted by Koestler.

1.9 Limits to growth

Bertrand Russell, in considering whether or not man has a future, canvassed the possibilities of the "nuclear age in which the human race is living, and may soon be dying", but ended his book on a hopeful note. "We are", he said, "suffering from undigested science. But in a world of more adventurous education this undigested mass would be assimilated...The liberation of the human spirit may be extended to lead to new splendours, new beauties, and new sublimities"²². A report, The Limits to Growth, for the Club of Rome, made by a research team at the Massachusetts Institute of Technology,

21. Ibid., p. 290

22. B. Russell, Has Man a Future?, Allen & Unwin, London, 1961, p. 134

and presented in the early 1970s, appears to limit the time available for Russell's "more adventurous education" to persuade, or to make it possible for man to adopt measures which may bring about the glowing future hoped for by Russell.²³ One may note that The Limits to Growth has been considered by one modern scientist as a work that "will probably be regarded in time as a book of importance comparable to other great seminal works which have changed man's thinking, for example Darwin's Evolution of Species..."²⁴.

The Report sets out fundamental limits to growth in global population, agriculture, resource-use, industry, and pollution. The research team concluded that, even under optimistic assumptions about advances in technology, the world cannot support present rates of economic and population growth for more than a few decades. Even though later criticism of computer modelling techniques used in this work may have made 'rubbery' the precise dating of possible shortages, of intolerable pollution and other matters referred to in the Report, they have not altered the basic argument that a rational state of equilibrium rather than one of uncontrolled growth is essential. It is admitted that any deliberate attempt to reach a rational and enduring state of equilibrium by planned measures, rather than by the imposed form of catastrophe, will be difficult, and will be based on fundamental change of philosophy: "our tradition, current activities and interests will make the transformation embattled and slow"²⁵.

It may be that mankind will regard warnings of difficulties as

23. D. Meadows et al, The Limits to Growth, Pan Books, London, 1975

24. J. O'M. Bockris (ed) Environmental Chemistry, Plenum Press, N.Y., 1978, p. 10

25. Ibid., p. 195

Cassandra prophecies, to be ignored until the overwhelming events of a catastrophe do act as an implacable educational agent. Working on the hope that such catastrophic education may be averted, consideration will be given, in a later chapter, to the question of the possibility of developing a 'sustainable' society, and in Chapter 8 matters relating to the formulation of an education system consonant with such a development will be discussed.

The greatest barrier to the necessary changes is not the absence of an intellectual understanding of the problems; anyone who can read and has even the slightest interest in the threats to man's survival brought by over-population, pollution, exhaustion of natural resources, or the insanity of nuclear warfare may now find a wealth of factual information on the shelves of practically any bookshop. It is not lack of data that causes hesitation in adopting necessary reforms; it is, instead, the dead weight of many centuries of deeply ingrained idealist beliefs that is likely to shackle man's attempts to save himself and the rest of living nature. It is this dead weight which must be cast off. This matter is dealt with more fully in Chapter 2, and one aspect of it is introduced in the following section (1.10).

1.10 Conquering the earth

The prodigal over-use of non-renewable resources, the poisoning of the earth's water, air and land by industrial wastes, and the destruction of topsoil and forests referred to in earlier paragraphs, may be regarded as results of man's arrogance in considering himself to be different from other living creatures, and thus not subject to the same laws of nature. The idea that man can conquer nature is dated by one writer on technology as originating "at least as early as the seventeenth century"²⁶. This puts the origin of the

26. W. Leiss, "Utopia and technology: reflections on the conquest of nature", International Social Science Journal, 22, 4 (1970), quoted in N. Cross et al (eds) Man-Made Futures, Hutchinson in assoc. with Open University Press, London, 1974, p. 20

idea many centuries late. It is at least as old as the teachings of the Old Testament. In Genesis, Chapter 1 we read; in verses 26 and 28:

. And God said, Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

. And God blessed them, and God said unto them, Be fruitful and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.

In all of the generations of Western man which have been subject to the inculcation of the Judeo-Christian philosophies, based on the supernaturalism or other-worldliness of philosophical idealism, the belief has been absorbed that man is of some superior order to "every [other] living thing that moveth upon the earth". The logical conclusion from this is that man can do, with divine approval, whatever he wishes to the living things that inhabit the earth. Fortunately, in man's long, slow development, his technical ability to destroy the ecological balance of natural systems was, for most of the period of humanity's existence on the earth, too puny to do irreparable damage. It is only since the full development of industrial society that the results of this attitude have led to possible disaster. By being fruitful and multiplying man has over-filled the earth with hungry people ²⁷; the human population is doubling every thirty-five years, and in the absence of catastrophe the earth's population within the

27. Sydney Morning Herald, 11 November 1980: "One in 10 children born last year has already died and one-fifth of all young children are under-nourished, according to a United Nations report published yesterday".

next twenty years will reach at least $5\frac{1}{2}$ billion* ²⁸. Some estimates put the figure as high as 7 billion.

Several authors support the above views. Glacken distinguishes between two traditions of the idea of man versus nature in Western thought,

the first being derived from the Old Testament, especially Genesis 1; the second, a product of modern times...[the] Genesis verses have taken on a new and ironical meaning in recent decades and in the immediate present...The acts of man ranging from deforestation to air pollution and nuclear warfare and the multiplication of man have given dramatic proof of his obedience to the orders of God...in addition to multiplying, to have dominion over the rest of creation ²⁹.

McHarg comments:

On the subject of man-nature...the Biblical creation story of the first chapter of Genesis, the source of the most generally accepted description of man's role and powers, not only fails to correspond to reality as we observe it, but in its insistence upon domination and subjugation of nature, encourages the most exploitative and destructive instincts in man ³⁰.

On the other hand, Keller expresses some disagreement with this view ³¹. He suggests that prehistoric people caused some environmental damage; and that, before the birth of Christianity, the early Greeks and Romans also affected the environment adversely. While he suggests that although "religious attitudes and beliefs are not a primary cause of the environmental crisis", yet this "does not suggest that religious activities are not responsible for considerable environmental disruption". However he holds that "the role

* 1 billion = 1 thousand million.

28. B. Ward and R. Dubos, Only One Earth, Deutsch, London, 1972, p. 213

29. C.J. Glacken, "Man Against Nature. An Outmoded Concept", in H.W. Helfrich Jr. (ed), The Environmental Crisis, Yale University Press, New Haven, 1970, pp. 129-130

30. I. L. McHarg, "The Plight", in ibid., p. 25

31. E.A. Keller, Environmental Geology, 2nd. ed., Chas.E. Merrill Publishing Co., Columbus, Ohio, 1979, pp. 9-11

of religion in causing, perpetuating, or condoning environmental degradation remains a much debated issue". He suggests that the immediate causes of environmental degradation are over-population, urbanisation and industrialisation, combined with "as yet, very little ethical regard for our land and inadequate institutions to cope with environmental stress".

It is likely that Keller underestimates the depth of the influence of the Judeo-Christian dogma of creation, and of biblical study on the culture of Western man. For a large period of recorded history this has been the cultural background of that section of mankind which has come to dominate the earth economically, industrially and militarily. As McHarg remarks, "the great western religions...have been the major source of our moral attitudes. It is from them that we have developed the preoccupation with the uniqueness of man"³². As a small sidelight on the extent to which the Biblical anthropocentric view has persisted to this day, together with its establishment of a dualism of humanity and nature, one may quote a recent remark made by a woman visitor to my home. "I wonder", she said, "what use God meant fleas and ticks to be to us". The remark was made quite seriously, and was merely an example of the cast of mind which is still common, and which may illustrate the apparent belief held by many people that all 'natural resources', of whatever kind, have been provided for man, solely so that they may be 'used' or 'developed' for what he may perceive to be for his own benefit.

The views of two further writers who have commented on the results of the 'Genesis' view of man's position in the world may

32. I. L. McHarg, op. cit., p. 25

be noted. Rifkin remarks that "the traditional Christian approach to nature has been a contributing factor to ecological destruction...[with] the concept of dominion in the account in Genesis of the Creation...the concept of dominion has been used by people to justify the ruthless manipulation and exploitation of nature"³³. O'Briant, in referring to Western tradition, considers the view that man is "apart from nature" - a "corollary of the belief that man is a unique creature". He is "made in the image of his Creator, and so is a supernatural man, one who in some way transcends the bounds of nature". This means that "man has a special relation to the other creatures. According to this view the other creatures were put here for man's use and enjoyment"³⁴. As we see ourselves "as exempt from the fate which has befallen other creatures in the course of natural history, so we also regard our present and future as free from the consequences of our past misbehavior. Our God shall save us from our sins, and we shall ultimately be transported to glory to live forever in comfort and ease"³⁵. The calamitous results of such beliefs have been noted earlier in this chapter.

33. J. Rifkin, Entropy, The Viking Press, N.Y., 1980, p. 235

34. W. H. O'Briant, "Man, Nature and the History of Philosophy", W. T. Blackstone (ed), Philosophy and Environmental Crisis, University of Georgia Press, Athens, USA, 1974, pp.79, 80

35. Ibid., p. 85

Chapter 2 THE TRIUMPH OF IDEALISM

2.1 Philosophical idealism

Reference was made, towards the end of section 1.9 of the previous chapter, to "the dead weight of many centuries of deeply ingrained idealist beliefs that is likely to shackle man's attempts to save himself and the rest of living nature". It is necessary to discuss further this statement. It is maintained in this study that, although other factors such as the level of technology and the economic interests of various sections of the community have influenced the development of society and of education to the stage in which we now find ourselves, yet there has been another powerful influence, namely, philosophical idealism. Furthermore, aspects of such idealism have acted as barriers to the development of a peaceful, progressive, civilised world community; and inasmuch as the customs and habits of thought characterising society are reflected in its education system, the same idealism has been a significant factor in retarding the development of an education system which will be put forward as desirable. It will be asserted that such a desirable system may be based on consideration of non-idealist philosophy.

It is contended that man should be educated in such a way that will lead him to understand that his very survival as a species depends on a realisation that he is not separated by some supernatural, supramundane, or divine arrangement, from the rest of the natural world. His fate is inextricably linked with, and dependent on, other living creatures and non-living substances to be found within the confines of the material and finite planet he inhabits. The further suggestions are put forward in later chapters that any

desirable school system should be democratic in its application; and such that people coming out of such schooling should understand that, for survival, man needs to be a fully co-operative animal. It is held that the commonly-held opposing view, namely that pupils should be trained as competitive units (deriving from an idealist notion that individuals are basically responsible, not to the rest of humanity, but to some supernatural entity) can act as a menace to mankind's well-being. In the earlier parts of this study, attention will be paid to the historical development of society and education, as affected by early and developing aspects of idealism.

It should be pointed out immediately that 'philosophical idealism' should not be confused with 'idealism' as the latter term is used in ordinary speech. In referring to such 'idealism' one customarily visualises habits of life and systems of values which cause persons to act altruistically. Nor should 'philosophical materialism' be confused with the common-speech view of 'materialism', that is, a system of beliefs that leads people to value material possessions highly. Although there are many subtle variations of philosophical idealism, basically idealism puts forward the view that reality is not to be identified with the physical world: reality is essentially mental or spiritual. In practice, idealism is almost invariably linked with some aspect of religion. On the other hand materialism puts forward the opinion that nothing exists but matter, its movements and modifications; that "the universe is not governed by intelligence, purpose, or final causes...that nothing supernatural exists"¹.

1. D.D. Runes, Dictionary of Philosophy, Littlefield, Adams, N.J., 1966 reprint, p. 189

It is notable that the history of philosophy is very largely the history of idealism ². In fact a twentieth-century idealist philosopher, Benedetto Croce would go so far as to imply that 'pure' philosophy is always idealism ³. Suggested reasons for the domination of idealism in the tenets of what might be called 'orthodox' philosophers, or, as they have been called, the "unofficial theologians who teach philosophy" ⁴ may be given.

It is suggested that significant reasons for the dominance of idealistic thought rather than materialistic thought throughout great portions of the past two thousand years are: (1) the close relationship between idealism and religion, together with the ideological repression of materialistic thought and the physical repression - sometimes physical obliteration - of materialist thinkers, which have occurred through the centuries; and (2) the fact that idealism lends itself admirably to the weaving of almost infinitely subtle and varied webs of thought, spun from the inner recesses of the minds of idealist philosophers. The shape and extent of the web is limited only by the imaginative processes of the philosopher. A materialist philosophy, on the other hand, must be built on the basis of observation of the world and its phenomena only; its shape and size are limited by verifiable occurrences. The former process seems to be more agreeable to scholastic or academically-minded persons than do the more down-to-earth conclusions of materialism. Many examples of the repression of materialism and its thinkers could be given. One, however, will suffice at present: the case

2. Ibid., p. 137

3. B. Croce, Introduction to G. Gentile, The Reform of Education, trans. D. Bigongiari, Harcourt Grace, N.Y., 1922, p. vii

4. L. Hogben, Science for the Citizen, 4th. imp., 2nd. ed., George Allen & Unwin, London, 1943, p. 251

of Giordano Bruno, who, after being handed over to the Inquisition, was gaoled for eight years, then burned to death. Bruno, a wandering ex-priest, was fascinated by the immensity of the universe which the astronomy of his day was revealing; he supported the "materialist vision of countless worlds and the Copernican theory and poured his scorn on the Aristotelian system...he mocked the saints, the eucharist, asceticism, pessimism and the Papacy". His thinking included aspects of a theory of evolution, his work containing a foreshadowing of Darwin, when he wrote of "the principle of the survival of the 'best-adapted' beings...[and a] natural transition from the homogeneous to the heterogeneous, from the indefinite and simple to the more or less complex compositions" ⁵.

In the history of mankind there have occurred from time to time social, political and intellectual events which have acted as barriers to the advance of mankind from one condition to a more propitious one. The question arises as to the possibility that such barriers may have been avoided. Speculation on the possible consequences of alternative streams of history is not an example of mere fantasy-spinning. A consideration of the courses that civilisation might have taken, if at crucial points of history other paths had been chosen, may carry lessons for present activities and practical choices which could have important consequences for the future. The story of civilisation is not an unrolling, pre-determined programme. What will happen depends on what decisions are made now; and of particular significance is the consideration of what systems of values, views on the nature of man and his place in the universe, and on the nature

5. J. Lindsay, A Short History of Culture from Prehistory to the Renaissance, Studio Books, Longacre Press, London, 1962, pp. 383-384

of knowledge, are adopted as the basis for such decisions; in other words, what systems of philosophy are influential in shaping the thinking of members of communities. Systems of philosophy are not merely suitable subjects for learned and subtle disputations on which may be erected academic empires, and the emanations of which fill many kilometres of university library shelves: they are also powerful factors in conditioning practical activity.

Even a politician, for instance, who may never have heard of various philosophical schools or patterns of thought, chooses in fact one or another philosophy in applying value-judgments to some political act. Similarly educators work, even if unconsciously, in the framework of one or another philosophical system, in deciding what should be in a curriculum and how pupils are to be regarded, treated and selected. Certain aspects of philosophy are so deeply rooted in the traditions of Western thought that their manifestations may appear, particularly in educational practice, without any conscious realisation on the part of those carrying on some activity that they are indeed influenced by those traditions. Such a lack of consciousness on the part of so-called 'practical' people does not in any way diminish the benefits to be gained by an examination of such traditions. Analysis may well lead to more propitious activities - and to the clarification of reasons for activities.

2.2 Early philosophical idealism

The growth of a system of philosophy which became dominant nearly two thousand years ago has had a lasting and deleterious effect on education. This was the Platonic-Aristotelian triumph of philosophical idealism over the materialistic views of their predecessors, the Ionian Greeks. It led to the arresting of scientific investigation

and development for a period amounting to about one-fifth of all our recorded history ⁶ - over a thousand years - an immense gap in the advance of man's understanding of the universe, and a period in which there occurred grave distortions of man's idea of himself, and an almost complete cessation in the development of a desirable system of education. I must agree wholeheartedly with Dr..Carl Sagan that, but for this thousand-year hiatus, mankind could by now have developed to societal, scientific, technical and cultural competences the details of which we would find, in our present condition, quite unimaginable ⁷.

The Ionian Greek philosophers, the so-called 'pre-Socratics', approached the questions: "What are things really like?" and "How can we explain the processes of change?" for the first time in man's recorded history in such a way as to eliminate all considerations of spirits, ghosts, gods and all the other supernaturalistic and other-worldly considerations which had been common prior to their time, and which were resurrected and re-imposed on man's thinking by later idealists. In short, they temporarily "shifted the basis of thought from a mythological base to one of scientific inquiry" ⁸. Thales, in the sixth century B.C., attempted to reduce the number of hypotheses needed to explain a multiplicity of phenomena by postulating that

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6. G. Childe, What Happened in History, Penguin, Middlesex, 1946 reprint, p. 83: "...they have invented writing. Soon after 3000 B.C. the writing becomes fully intelligible to modern philologists". Hence
 7. 'recorded history' has covered some 5,000 years.
 7. C. Sagan, Cosmos, Australian Broadcasting Commission television programme, August 1982; and Cosmos, Macdonald Futura Publishers, London, 1981 reprint, Chapter VIII
 8. S.E. Stumpf, Socrates to Sartre: A History of Philosophy, McGraw Hill, N.Y., 1966, p. 6

one substance was the basis of all matter. The fact that he chose water was not important. The important fact was that in conjecturing that "there is a substance from which all other things come to be, it being conserved"⁹, he relied on no superstitious or supernatural explanations.

Somewhat later Anaximander postulated an unnamed and unlimited substance as the basis of all matter, the cycle of nature giving rise to an alternation of opposites; and Anaximenes considered that all matter is based on air. It was Anaximander who first mapped the known world on a tablet, and constructed a celestial sphere. His use of a model to illustrate the observed facts concerning heavenly bodies was far removed from the mythological fancies of earlier times. His explanations of the nature of the sun and stars (the stars being compressions of air, contained in fire-filled wheels throwing out flames through openings) were, even if incorrect, based on observations of technology, not on the purely fanciful supernaturalism of later idealists such as Plato. The materialist rejection of supernaturalism was further reflected in his evolutionary hypothesis, in which he considered that fish preceded land animals as a form of life; that as dry land appeared, some fish became adapted to life on land. Man had, accordingly, descended from aquatic creatures.

A philosopher of the fifth century, Empedocles, discovered by experimenting that air is a physical substance capable of occupying space and exerting a pressure. He noted that if air is prevented

9. S. Sambursky, The Physical World of the Greeks, trans. M. Dagut, Routledge & Kegan Paul, London, 1956, p. 7

from leaving a hollow vessel which is then immersed in water, the entrapped air prevents the entry of water; and allowing the air to flow out permits the entrance of water. Such understanding was evidently lost in the succeeding centuries; under the influence of other-worldly idealism, gases and vapours became 'spirits'; relics of such beliefs are retained in the language, for example, 'spirits of salt', 'spirits of wine', 'spirituous liquors'. Not until two thousand years had passed was there again achieved a clear recognition of the existence of a third state of matter, a recognition marked by Jan Van Helmont's naming of the third state with a Flemish word which is now rendered as 'gas'.

Anaxagoras who, like Empedocles, lived in the fifth century B.C., also would have nothing to do with the mythological cosmogony which endowed the heavenly bodies with divinity. In contrast to Aristotle and other later philosophers who taught that the 'heavenly realm' was subject to conditions and laws completely different from those on earth, Anaxagoras held that there was no difference between heaven and earth. He gave a physical interpretation of astronomical phenomena. The heavenly bodies, he said, were 'flaming stones', not divinities. This may be contrasted with the later Platonic version: "the fixed stars...are living beings divine and eternal"¹⁰. The views of Anaxagoras brought on him the anathema which in later centuries was the common fate visited on materialists by the religious. He was tried on a charge of atheism and sentenced to a term of imprisonment which was commuted to deportation only through the personal intervention of the influential Pericles.

10. Plato, Timaeus and Critias, trans. H.D.P. Lee, Penguin, Middlesex, 1971 reissue, p. 55

Eighteen hundred years before Copernicus, a further Greek philosopher, Aristarchus, developed the hypothesis that the earth revolves around the sun and rotates on its own axis. Plutarch's book On the Face of the Moon records that Aristarchus's hypothesis failed to gain acceptance for religious reasons, and that Aristarchus nearly met the same fate as Anaxagoras. It has also been noted that the position was still more serious in the time of Aristarchus than in Anaxagoras' day: the central position of the earth and its absolute rest, as formulated by Aristotle, had in the meantime become an axiom without in any way detracting from the divine quality of the stars in their unvarying courses...the two conceptions...became aspects of the same strongly religious cosmic view¹¹.

The pattern of the long history of idealistic and religious intolerance of materialistic hypotheses was thus set early in man's serious investigation of the mysteries of the universe. By the time of Copernicus and Galileo the position had become even more hazardous, the intolerance immensely more powerful; "the religious argument had been made immeasurably more weighty by the evidence of the Bible and the authority assigned to Aristotle by the Church"¹².

2.3 The eclipse of materialism

In view of the strength of idealism, particularly in its reflection in religion, it is not surprising that the ideas of the materialist atomists, from Leucippus to Epicurus, were put to one side. Democritus believed and stated that the universe was not created by any outside power. Such a view would have been enough in itself to render suspect any other hypothesis put forward by Democritus and his successors, even including the suggestion that matter consists of 'atoms and

11. S. Sambursky, op. cit., p. 71

12. Ibid., p. 72

the void', the possibility that there exist minute particles moving in an ambience of space (or vacuum). A materialist view of the development of life and of human culture, as set out in one of the most perceptive pieces of writing in all of early history - and possibly from the pen of Democritus - was completely opposed by Platonic-idealist beliefs. Unfortunately for the sound development of science, practically all of the atomists' writings disappeared - "probably the greatest loss we have suffered" ¹³. On the other hand the writings of their great opponents, Plato and Aristotle, were preserved almost in full: a case of history being written by the victors. "Aristotle devoted much of his energy to verbal refutations of the sound experimental physics of his Ionian predecessors ...Plato...declared that all the works of Democritus ought to be burned" ¹⁴. One wonders if they were; book-burning has been a practice of the 'orthodox' throughout the centuries, and still operates among some so-called educational authorities, under the influence of fundamentalist religious groups ¹⁵.

The account of the evolution of life, and of the development of human culture which was referred to in the previous paragraph is, despite its inaccuracies, so startlingly 'modern' in temper, particularly in the light of the fact that it is almost 2500 years old, that it warrants very extensive quotation.

The earth at first was muddy and quite soft. It was only owing to the action of the sun's heat that the earth began to harden. Then, on account of the heat, some of the moist elements swelled and the earth began to bubble up at many places. At these places there formed fermentations enclosed in delicate membranes, a

13. B. Farrington, Greek Science, Its Meaning For Us, Penguin, Middlesex, 1944, p. 58

14. L. Hogben, op. cit., p. 77

15. The Australian (newspaper) July 17-18 1982: an account is given of the burning of school books under the influence of "the growing flood of American Puritans".

phenomenon still to be observed in marshes and bogs when a rapid rise in temperature of the air supervenes suddenly on a chilling of the earth. In this manner, through the action of the heat, the moist elements began to produce life. The embryos thus formed got their nourishment at night from the mist which fell from the surrounding air, while by day the action of the sun's heat imparted firmness. At the end of this stage, when the embryos had got their full development and the membranes had been dried up by the heat and had burst, all sorts of living things came forth.

Of these, those which had the largest share of heat went off to the upper regions and became birds; those which had a greater admixture of earth formed the class of creeping things and other land animals; while those which had more of the moist elements went off to the region akin to them and became what we call fish. But the continuing action of the sun and wind hardened the earth still more, until it was no longer able to bring to life any of the larger creatures, but each of the larger living things was reproduced through intercourse of like with like.

The first men lived a random life like wild animals, going out to pasture independently of one another, moving towards whatever vegetation attracted them and to the uncultivated fruits of the trees. It was expediency that taught them to cooperate because individuals became the prey of wild beasts. It was only when fear brought them together that they slowly arrived at mutual recognition of their common form. Their utterance was at first confused and without significance. It was only gradually that they became articulate; but they did not all use the same forms of speech, for each group had determined their locutions as chance decided. Accordingly all sorts of languages came into existence *. The first groups of men to be constituted became parents of all the races of mankind.

* One may contrast this account of the development of various languages with that put forward in Chapter 11 of the book of Genesis in the Bible, which describes the God-scrambled origin of diverse languages, resulting from a bumptious human attempt to build a brick column reaching from earth to heaven.

Since none of the conveniences of life had been discovered, the first men lived a burdensome life. They were without any clothing, unacquainted with houses or fire, and had no idea at all of cultivated foods. Even the idea of making a store of wild foods had not occurred to them and they made no provision against want. The result was that they died in great numbers during the winters through cold and lack of nourishment. Gradually, however, learning from experience, they began to take refuge in caves during the winter, and to store such fruits as admitted of being kept. Then fire and other conveniences were discovered, and the arts and all the things that promote social life were invented. The general law of the process is that it is necessity that teaches man everything. Necessity is the intimate guide who conducts man through every lesson, and necessity has in man a naturally-apt pupil, equipped as he is with hands, speech and mother-wit for every purpose ¹⁶.

Here we have a set of inferences based on a thoughtful observation of nature. None of the hypotheses depends on the presentation of the fabric of a 'Demi-Urge', a 'First Cause', a 'Final Cause', or any of the other-worldly and idealistic notions woven by later philosophers. As Farrington notes, the account is "extraordinarily impressive".

16. Quoted in B. Farrington, op. cit., pp. 74-76, in which it is noted that this sketch survives in the history of Diodorus Siculus, Bk. I, chaps. vii and viii. Its attribution to Democritus was plausibly suggested by K. Reinhardt (Hermes, Band 47, pp. 492 ff) but this attribution is contested by others on the ground that the sketch contains no clear reference to atomism. (The strength of such criticism is doubtful; it is not easy to see how any specific reference to atomism would be relevant to the material in the sketch - N.M.).

2.4 Platonism

The above material has been quoted at what might appear to be inordinate length, precisely because it contrasts so sharply with the hotch-potch of peculiar notions put forward by Plato in considering the origins of man, of woman, and of animals. In the Timaeus Plato stated that man is generated by the gods; by a process of degeneration of man there are formed women¹⁷ and non-human living beings. Women, representing a low form of life, degenerated from cowards and those who lived immoral lives¹⁸. Birds, according to this philosopher, developed from people who were so misguided as to trust the evidence of their senses; land animals developed from men who had no use for philosophy; and fish, including shellfish and all other aquatic creatures, originated from the most foolish, stupid and unworthy of these.

Plato's version of the development of the human body has the air of being a parody of a serious explanation; he sets out how the body was devised by "the agency and providence of the gods", as follows:

They copied the shape of the universe and fastened the two divine orbits of the soul into a spherical body, which we now call the head, the divinest part of us which controls all the rest; they then put together the body as a whole to serve the head. And to prevent the head from rolling about on the earth, unable to get over or out of its many heights and hollows, they provided that the body should act as a convenient vehicle. It was given height and grew four limbs which could bend and stretch, and with which it could take hold of things and support itself, and so by god's contrivance move in all directions

17. Plato, op. cit., pp. 57-58

18. Ibid., p. 120

19. Ibid., p. 121

carrying on top of it our divinest and holiest part. That is the reason why we all have arms and legs...it was necessary to distinguish the front of man's body and make it different from the back; and to do this they placed the face on this side of the sphere of the head ²⁰.

It has been strongly urged by a vast number of writers over the centuries that Plato possessed a first-class intellect. It would, however, be difficult to dispute that the methods of thinking displayed in the earlier materialistic sketch quoted above demonstrated a far more admirable application of the intellect than is displayed in the Platonic notions.

Concerning the nature of reality, Plato argued that a non-material world of Ideas or Forms presented the only true reality, that reality does not **reside** in the visible world of actual objects. The latter are merely imperfect copies of the perfect patterns which exist outside time and space. A carpenter, for instance, in constructing a bed, copies God's ideal pattern of a bed. "God created one essential Bed...he wanted to be the real Creator of a real Bed" ²¹. All humanly-constructed beds are less-than-ideal representations of God's idea of a bed. Not only beds, but also all other objects can be constructed only after they have first appeared, in some intangible form, in the mind of a supernatural being. As Farrington remarks,

The technicians of the ancient world must have found it... embarrassing to be told to wait upon the divine initiative before originating, or even improving, any technical device, since the present stage of technical development represented the divine plan ²².

20. Ibid., pp. 60-61

21. Plato, The Republic, trans. H.D.P. Lee, Penguin, Middlesex, 1963 reprint, p. 373

22. B. Farrington, op. cit., p. 96

According to the Platonic view, inventiveness in technique could not result from intelligent observation and the application of human ingenuity, exercised on the basis of practical experience, but would rest on an inspirational insight into the eternally-existing other-worldly pattern of the divine Idea. Plato had, of course, no conception corresponding to the phrase 'the dignity of labour'. Both he and his successor, Aristotle, regarded the performance of manual work as degrading, fit only for inferior classes, in particular, slaves. We may see the persistence of this idea in the lower status commonly given to 'manual' work (even under its more modern name, 'technics') than to so-called 'intellectual' studies in today's high schools.

As pointed out in detail by Popper, both Plato's views on the organisation of an 'ideal' state and on the accompanying education system revealed an elitism which is contemptuous both of the mass of the people and of the use of the hands in productive labour²³. The influence of the ideas held by Plato has been long-lasting. Over two thousand years later, for instance, it was the opinion of Rousseau that Plato's Republic was "the finest treatise on education ever written"²⁴. Even in the twentieth century no book on the bases of education appears to be complete without a reference - often an obeisance - to Plato's beliefs. A book which, at the time of publication appeared to be devoted to the most modern ideas on education: those of the New Education Fellowship, meeting in international

23. K. R. Popper, The Open Society and its Enemies, Vol. I: The Spell of Plato, 4th. ed. (rev.), Routledge & Kegan Paul, London 1962

24. W. Boyd (ed), Emile for Today. The Emile of Jean Jacques Rousseau, Heinemann, London, 1963 reprint, p. 13

conference in 1937, had no less than thirteen indexed references to Plato²⁵.

In Plato's ideal state the people were to be divided into three classes: the workers, the military and the rulers. Only the rulers were to receive higher education. The principal elements of Plato's prescription for the organisation of the ideal state (with which is inextricably entwined his prescription for education) were summarised by Popper as:

- (A) The strict division of the classes; i.e. the ruling class consisting of herdsmen and watch-dogs must be strictly separated from the human cattle.
- (B) The identificiation of the fate of the state with that of the ruling class; the exclusive interest of this class, and in its unity; and subservient to this unity, the rigid rules for breeding and educating this class, and the strict supervision and collectivization of the interests of its members.

The ruling class was to have "a monopoly of things like military virtues and training, and of the right to carry arms and to receive education"²⁶. (Emphasis added). All individuals were to be strictly subordinated to the state. Perfect justice would be served by an arrangement whereby each person would do the job he was 'best fitted' for; the judgment on fitness would no doubt be made by the rulers. Good citizenship was a matter of doing the rulers' bidding.

2.5 Hegelian idealism and the state

A repetition of much of this is to be seen in eighteenth-century (A.D.) Hegelian idealism. According to Hegel, "only those people can come under our notice which form a state. For it must be understood

²⁵ . K. S. Cunningham (ed), Education for Complete Living, Australian Council for Educational Research, Melbourne, 1938

²⁶ . K. R. Popper, op. cit., pp. 86-87

that this latter is the realization of freedom..."; and "the State is the Divine Idea as it exists on earth". Furthermore he held that the state is "the moral whole and the Reality of Freedom". that "Freedom is nothing but recognition and adoption of such universal substantial objects as Right and Law, and the production of a reality that is accordant with them - the State" ²⁷. Such beliefs support totalitarianism of the right or of the left, with major implications for the peaceful advance of mankind, and for the educational practices of nations so affected. The acceptance of the state as being something in which the ideal is realised; the belief that the good of the state is not to be judged by the happiness of the individual, but that the happiness of the individual is to be judged by the good of the state, are grave consequences of one aspect of idealism. "In the conception...of the state as a totality, which is an end in itself, an end to which the lives of men and woman are mere means, we have the working model of an Absolute" ²⁸. Such a conception leads to a passive acquiescence in things as they are, or, still worse, "into a slavish adulation of the Absolute in whose hands we are mere pawns" ²⁹. Hobhouse regarded Hegel as the apologist for modern totalitarianism; similarly Popper regarded Plato as providing an intellectual basis for totalitarianism.

In Plato's suggested organisation of society, recourse was to be had to lying, or, as it is put today, propaganda. This was to be used in order to persuade the populace that a three-tiered

27. S. Commins and R. Linscott (eds), Man and the State: The Political Philosophers, quoting Hegel's essay "Philosophical History", The Pocket Library, Random House, N.Y., 1954, pp. 445, 446

28. L.T. Hobhouse, The Metaphysical Theory of the State, George Allen & Unwin, London, 6th. imp., 1960, p. 19

29. Loc. cit.

arrangement of society was just. There would thus be propagated what Plato called "a convenient story" that God had framed humanity into three different types of beings³⁰. There was no notion of equality at all, no necessity to put forward even the single Commandment of Animal Farm: "All animals are created equal, but some animals are more equal than others"³¹. The "convenient story" was to be used to inculcate "the love of servitude [which] cannot be established except as the result of a deep personal revolution in human minds"³². That the idealist view of the inherent inequality of three types of mankind has persisted over the intervening twenty three centuries is attested by an opinion put forward by an educator in the 1960s:

Why do we not admit that a substantial part of the population is simply uneducable in any real sense of the word educate and shape our plans accordingly?... humanity is composed of three groups: a relatively small group of the talented, a larger middle stratum of moderately intelligent people who are able and willing to accept the leadership and authority of the elite, and at the lowest level a great mass of people who may with great effort be capable of simple literacy but very little beyond that³³.

It would be difficult to find a more succinct paraphrase of Platonism.

2.6 Aristotle's views versus materialism

Aristotle, the most renowned of Plato's pupils, produced his most useful and successful scientific writings in the field of

30. Plato, The Republic, op. cit., pp. 159, 160

31. G. Orwell, Animal Farm, Penguin, Middlesex, 1963 reprint, p. 114

32. A. Huxley, Brave New World, Penguin, Middlesex, 1966 reprint, p. 13

33. G. M. Wingo, The Philosophy of American Education, Heath & Co., Boston, 1965, p. 109, quoted in C.. D. Marler, Philosophy and Schooling, Allyn & Bacon, Boston, 1975, p. 41

biology; the development of his close interest in this aspect of science may have been due to his early upbringing in the house of a medical man, his father having been court physician to the Macedonian king. Aristotle's physics, however, and the great influence of his ideas on succeeding generations, were the opposite of conducive to the advance of man's understanding of the universe, or even of terrestrial phenomena. He was not a physical experimentalist, apparently sharing Plato's aversion for manual activities. According to his teaching, for instance, since everything in the universe had its proper place, all motion was to be explained by the efforts of objects to reach their proper place. By the use of reason alone he maintained that a heavy object would return to its 'proper place', that is it would fall, more rapidly than a light one. It apparently never occurred to him to conduct a simple experiment to test this conclusion. He rejected Democritus's atomism, thus "dooming that concept through ancient and medieval times"³⁴. He rejected the idea that air has weight, even though the earlier Greek materialists, basing their conclusions on experience and experiment, had taught that air does have weight³⁵. The Ionian, Empedocles, had correctly interpreted the power of the common pump to raise water as being due to the weight of the air pressing on the source of the water³⁶. This was a logical interpretation based on simple experiments, an interpretation far removed from the belief in self-evident, á priori 'truths' promulgated by the Greek idealists.

34. I. Asimov, Biographical Encyclopedia of Science and Technology, Pan Books, London, rev. ed., 1972, p. 20

35. L. Hogben, op. cit., pp. 367-368

36. Ibid., p. 378

2.7 Idealism and the intellect

The idealist belief in the superiority of man's purely intellectual processes over that combination of manual dexterity and thinking which is the essence of scientific experimentation had a profound and retrograde effect on secondary education even in the twentieth century A.D., as witness the status of the 'Science Side' as the poor relation of the 'Classics Side' in the Great Public Schools of England in the early part of this century.

The idea that school education should be concerned primarily, even exclusively, with the education of the intellect, is an expression of elitism, and is still supported by many traditionalists. In Australia its main protagonist would probably be the Australian Council for Educational Standards (A.C.E.S.). The original sponsors of A.C.E.S., it may be noted, included nine staff members of universities or Colleges of Advanced Education, one consulting psychologist, and a former chairman of the National Council of Independent Schools, but not one practising teacher. The primary function of a school, it seems from a reading of the A.C.E.S. journal, is basic education in traditional subjects, organised according to the 'disciplines'. An integral part of education is the holding of regular, openly-competitive examinations. The education of the intellect appears to be the main drive of articles in the journal; considerations of the outside world are not prominent: in twenty-nine issues of the journal the word 'unemployment' occurred, in peripheral references, only about four or five times. While it must be agreed that the 'education of the intellect' should play a significant role in school work, yet it may seem doubtful that the requirements of modern youth faced with the prospect of coping

with an increasingly complex and difficult world are fully served by an almost exclusive concentration on this area.

2.8 Competition and co-operation

A writer on psychology and on educational matters, A. W. Combs, has recently stressed that one essential characteristic of persons suitably prepared to take their places in the after-school world is an ability to co-operate fully with others. "A school system that glorifies competition will, almost certainly, fail to prepare the students to live effectively in the modern world"³⁷. We live, notes Combs, in the most co-operative, interdependent society the world has known. As distinct from members of a primitive society, we depend from morning to night on thousands of others for the supply of our food, for warmth, for lighting, and all the other amenities and life-sustaining services available to us. The organisation of a school system that is based largely on the development of a fiercely competitive spirit through the institution of frequent and intensely competitive examinations may, therefore, be questioned. Not only has the ability to co-operate been "a necessary factor for human evolution"³⁸, but also its further development is essential for our survival. The development of such ability can be part of education. "The genetic contribution to man's nervous system is virtually complete at birth. Almost everything that happens thereafter is learned"³⁹. Co-operation is the key-note of "the new global ethic" stressed in the Belgrade Charter⁴⁰. We must see that the education system is organised so that co-operation is integral to its lessons.

37. A. W. Combs, Myths in Education. Allyn & Bacon, Boston, 1979, p. 15

38. A. Montague, The Nature of Human Aggression, Oxford University Press, N. Y., 1976, p. 140

39. K.E. Boulding, "Am I a Man or a Mouse - or Both?", in A. Montague (ed), Man and Aggression, Oxford University Press, N.Y., 2nd. ed., 1973, p. 172

40. See Appendix II, p. 167 this thesis.

Chapter 3 RELIGIOUS INFLUENCES

3.1 Further developments

Following on from consideration of the (largely Platonic) idealist views, attention will now be given to the further historical development of society and education. Firstly attention will be paid to what has been called 'post-Socratic' Greece, and to the Roman world, followed by the development of religious influences, including the drive for universal elementary education and its paradoxical results.

By the middle of the fifth century B.C. Athens had reached a high point in security, material prosperity and culture. In this period the trend of education changed, in line with changes in society.

The democratic tendencies in politics were consolidated in practice. All free inhabitants became citizens ... Here, of course, is where education was affected: the old education had given its attention to making citizens; the new education did not need nor did it fully understand such a purpose. In place of the objective of citizenship - service to the state - the ideal of individual development was substituted ¹.

With the move towards individual development came a progression towards the provision of a general or liberal education, to extend the usual educational fields which had consisted of some reading and writing, music and gymnastics; the group of teachers who were active in this extension were known as Sophists. Young men were tutored in grammar, literature and oratory. Those wishing to become influential in public life needed the skills of reasoning and public speaking. The formal studies of grammar, rhetoric and dialectic or logic were systematised.

1. E. J. Power, Main Currents in the History of Education, McGraw Hill, N.Y., 1962, p. 65

The extension of political democracy and of the expansion of the teaching of the formal disciplines should not be taken as indicating a beginning of mass education. The society was based on slavery, and even the poorer of the citizens had little, if any, access to the new flowering of education. The Sophists charged high fees; their provision of education was thus limited to the children of wealthy citizens - or rather the sons of these citizens; the education of woman and girls was still largely domestic. However the Sophists suited the times. It has been stated that they were

teachers who exactly fitted Abbé Fleury's later utilitarian interpretation of the history of education ... Fleury advanced the idea that educational innovations are in response to the "needs" of the times ... The success of the elder Sophists, despite Plato's attack on them, was indeed that they met what many sensed to be the needs of the times².

In doing this they irritated the elitist traditionalists. In the traditional view, virtue, or worth, could not be taught; it must be inherited from noble parents. The more democratic endeavour to teach virtue to non-aristocrats was disliked and condemned by the upholders of the old order. "The issue ... was the educational over-tone to a more basic political struggle occurring contemporaneously between aristocratic and democratic factions"³ - but these factions still excluded the mass of the people.

3.2 The Roman Empire

The rise of the Roman Empire was accompanied by further changes

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2. R. H. Beck, A Social History of Education, Prentice-Hall, N.J., 1965, p. 13
 3. J. S. Brubacher, A History of the Problems of Education, McGraw Hill, N.Y., 1966, pp. 99-100

in the nature of education. The Romans were practical rather than speculative and philosophical. Their genius lay in the efficient organisation of warfare and conquest, law, administration, and practical engineering; sections of their engineering works have lasted until the present day. Nevertheless technology did not markedly extend past the large-scale engineering feats. The basing of the social system on slavery meant that much of the labour was that of slaves, a system which has never developed an intensive search for labour-saving technology. Again the characteristics of the society moulded education.

In early times it was what the education of rude people has generally been, namely a static education gained by observation, participation and custom. ... The learning of the schools, when schools developed, was book learning lacking the music and gymnastics which had given the Athenian curriculum a well-rounded character ... but the Romans made one improvement. They organised ... a chain of articulated schools... This was the result of the Roman demand for an orderly system⁴.

The Romans, engaged in a series of extensive military expeditions undertaken in order to expand and consolidate their empire, had, initially, little time for educational elaboration. With the maturing of Rome's position as a world power, however, "secondary schools on the Greek model began to make an appearance to give the advanced training necessary for the rulers of empire"⁵. but not, it may be noted, for the mass of the people. There was a further restriction. The 'rulers of empire' were males; in the writings of Quintillian, an influential educator, there is no reference to the education of girls.*

4. H. G. Good, A History of Western Education, 2nd. ed., Macmillan, N.Y., 1969, p. 55

5. J. S. Brubacher, op. cit., pp. 394-395

* Quintillian was, however, writing about the education of orators. Presumably some elementary education was available for girls.

3.3 The early Christian church and education

With the collapse of the Roman Empire, it is quite possible that formal schooling would also have vanished, had it not been for the paradoxical educational activities of the Christian church.

The paradox lay in the fact that, while the church

took a private interest in education ... not so much to cultivate learning for its own sake as to train students for lay and professional duties in the church and also for the civil ones that devolved upon it with the disintegration of political authority [and later] it was the monasteries whose ... interest in education managed to keep the flickering light of learning from going out altogether ⁶,

yet the free spirit of enquiry, the close and speculative examination of natural phenomena that had been features of the early Greek world, and had continued to some extent in the Roman world, were all but extinguished. The standpoint of the early church was not conducive to the objective study and recording of natural phenomena. The world was God's footstool, and all its aspects were less worthy of examination than were the things of religion. Even a close study of the stars could, it was felt, lead to indifference to God.

The purpose of the noting of natural facts was not to push forward the frontiers of knowledge but to find illustrations for the revealed truths of morality and religion. An examination of nature was not expected to lead to the development of hypotheses, but to provide vivid symbols of moral realities. Education, in such

6. Ibid., p. 510

circumstances, could not be expected to be innovative or wide-ranging.

The first Christian generation lived almost entirely on expectations and dreams. On the eve of seeing the world come to an end, they regarded as useless everything which only served to prolong it ... Everything which attaches man to earth, everything which draws him aside from heaven, was to be avoided ⁷.

There was a "withdrawal from the material world, contempt for knowledge, science and technology; rejection of the body and its pleasures in favour of the life of the spirit" ⁸. In the minds of those early Christian leaders who represented the mainstream of orthodoxy (which in those times meant members of the majority sect) "knowledge was as often the parent of heresy as of devotion"; and it was said of sects that did not whole-heartedly concede the over-riding authority of the "successors to the apostles" that

The science of the church is neglected for the study of geometry, and they lose sight of heaven while they are employed in measuring the earth. Euclid is perpetually in their hands... Their errors are derived from the abuse of the arts and sciences of the infidels, and they corrupt the simplicity of the Gospel by the refinements of human reason ⁹.

During the first half of the period from the fall of the Roman Empire to about the year 1400 A.D., often termed the "Dark Ages", while theological disputation occupied much of the intellectual life of the 'educated', the lives of the ordinary people flowed on much as they always had. Food was grown and harvested; or crops failed and

7. E. Renan, The Life of Jesus, Thinkers' Library, Watts & Co., London, 1935, p. 161

8. A. Koestler, The Sleepwalkers, Penguin, Middlesex (first pub. 1959; Penguin 1964), p. 53

9. E. Gibbon, The Decline and Fall of the Roman Empire, Vol. 1, Everyman's Library, J.M. Dent & Sons, London, 1914 reprint, pp. 495-496, quoting Eusebius

people hungered; goods were transported about Europe; markets and fairs acted as distribution centres; sheep-herders, fishermen and salt gatherers as well as other small-scale producers went about their daily work. The education 'system' - if it could be called such - ignored the folk-life. Latin became the only accepted language for the Christian church, the vernacular being disparaged. With the development of the church as an institution, formal education for the few reflected the needs of the church in organising itself for the task of presiding over the spiritual well-being of the Christian section of the populace and endeavouring to proselytize the rest. The physical needs of the ordinary people, the preservation and extension of secular skills, and the slow and fumbling advances in the technologies of production and transportation, were nurtured by methods of informal, largely domestic, education - as had been in the past, and would be for many centuries to come. Church education reflected the major concern of those who were influential in the community, namely the preparation of the soul for the next life; for the rest the main concern was the survival of the body in this life. Idealism flourished as the basis of formal education.

As the centuries moved on from the middle of the first millenium, the western part of the Roman Empire was over-run, in its various sections, by a kaleidoscopic, criss-crossing movement of 'barbarian' tribes: Ostrogoths, Vandals, Visigoths, Franks and Huns. In particular the number of Goths multiplied and they scattered over the soil of Italy. The arts of war were reserved for the Goths, and the invaders retained their mother-tongue. The education provided by the church schools was regarded with contempt; the Goths' leader

Theodoric declared that "the child who had trembled at a rod would never dare to look upon a sword" ¹⁰. Schools throughout the whole Empire, except for those preparing monks and clergy for God's work, practically died out.

Recovery required the slow passage of almost a thousand years. The barbarian tribes had no intellectual heritage to contribute. Artistic and literary works were largely destroyed with the towns and cities, and as "the only use for learning was now in the service of the Church, education became limited to the narrow lines which offered such preparation and to the few who needed it" ¹¹. The monasteries, with their monastery schools, became places of narrow study, as well as places of seclusion and meditation. Boys, sometimes only eleven or twelve years of age, were accepted into training. In order that they might be occupied in reading the sacred writings, it was necessary that they be taught to read. The art of printing not having made its appearance, it was also necessary that at least some learned the art of lettering so that any desired copying of manuscripts might be carried out by hand. Some instruction in music was befitting; and possibly some simple calculating skills were required, in order to set the dates of holy days. Latin became the obligatory language of the students. For many centuries formal education became, in the western world, the monopoly of the church, being maintained in the service of the Christian god, and involving a minute fraction of the people.

10. *Ibid.*, p. 124

11. E. P. Cubberley, The History of Education, Constable, London, 1920, p. 126

3.4 Later Christianity and the drive towards literacy

In view of the narrow uses of literacy noted above, and its restriction to an elite group, there is not a little irony in the fact that a general movement towards mass education having the aim of producing mass literacy was also the result of a religious development - but one that occurred much later, in the sixteenth century A.D. The programme of the campaign was still a narrow one: to enable the masses to read the Bible; but once liberated, the genie of mass literacy "could not be put back into the bottle"; there was generated "a wide public who read ... pamphlets, ballads ... newspapers" ¹². The programme escaped from the control of the religious. The drive for mass literacy was one result of an attempt to reform the practices of the Catholic Church. The activities that followed the posting of Luther's Ninety-five Theses attacking the sale of indulgences and other practices of the church on All-Saints' Day in 1517 crystallised rather than initiated a movement towards what became known as Protestantism. Opposition to various aspects of the ruling church had a long history, an early expression being given, for instance, by the Lollards. The ground was fertile for the spread of Luther's movement; but as is usual in religious movements, the initial doctrines branched as do the waters of a delta, forming fresh channels as they move away from their point of origin. Protestantism gave rise to a multitude of churches, in a number of countries.

12. L. Stone, "Literacy and Education in England, 1640-1900", Past and Present, No. 42, p. 84

A common demand, however, of Protestants of whatever variety was for individual reading of the Bible by all the people. "Protestantism was a culture of the book, of a literate society ... God's people were to be a literate people, taking in God's word from the printed page" ¹³. The extension of literacy, the expansion of the necessary elementary schooling, were impelled almost solely by the perceived necessity to study the Bible in order to obtain salvation, and were made practically possible by the advent of the printed book. The application of moveable type to relatively cheap paper, combined with the Protestant drive for literacy, had the unforeseen, and from the point of view of influential figures in society, undesirable result of changing the educational configuration of Europe within a century. In the event, as mentioned above, the reading habits of the literate overshot the boundaries of religious idealist literature. According to Stone, between 1500 and 1525 A.D. the number of books produced annually rose from 40 to 500; and in England "2000 different pamphlets were published in 1642 alone, over 700 newspapers were issued in 1645, and between 1640 and 1660 the combined total of both types of literature amounted to 22,000 items" ¹⁴.

However, neither the technology of printing nor the extension of literacy produced a period of intellectual flowering comparable with the Greek classical period, even if we compare only the elite of both periods. The education system had been organised and largely controlled by the clergy, and was not directed to any free-ranging or dogma-free examination of the phenomena of nature or

13. Ibid., pp. 78-79

14. Ibid., p. 71

of ethics or politics. It was a restricted education, and that given to the 'lower orders' had the aims of concentrating their attention on Bible-reading, morals, obedience, together with a willingness to accept docilely the place in society to which God had called them.

3.5 English 'classical' education

As for the 'upper classes', taking England in particular as an example, a dominant influence in education became not so much the unfettered examination of the universe or even of the planet Earth, and of man's place in it, as a constricted worship of the classics. Originally the function of studying the classics, as in the period of the Renaissance, was to preserve the values and the knowledge of the ancient world. In the late sixteenth and the seventeenth centuries A.D. in England, however, the function of such education had become "the preservation of higher culture as the distinctive monopoly of a social class"¹⁵. In this connection Stone characterised the education given to the English upper classes and the socially ambitious middle class, by means of which they were able to command all important positions in society, as being equivalent to a primitive puberty rite. His description deserves full quotation. There was, he said,

developed in England in the sixteenth century, and strengthened and intensified in the nineteenth, a very peculiar educational system. It involved instruction of upper-class youths by a group of bachelors in the mysteries of the tribe and the wisdom

15. Ibid., p. 71

of ancestors, expressed in a dead secret language, the mastery of which took years of diligent, dreary practice; sexual and group segregation in an isolated compound, in association exclusively with other males of the same age; heroic (but quite futile) efforts to enforce total sexual abstinence; submission to deliberately inflicted cruelties, especially flogging on the buttocks; conformity to a series of severe and not easily comprehensible taboos; a regime of physical exercise, cold baths, spartan diet, primitive living conditions, severe routinized discipline, regular moral and religious exhortation, all devised to produce qualities of endurance, courage, and a sense of leadership ¹⁶.

3.6 Conditions favouring freedom of thought

The conditions which produced the ancient Greek flowering of the intellect, and the conditions of some two thousand years later were, of course, quite different. What were the conditions in which reason, unaffected by supernaturalism, had full play? In the case of the materialist Greeks, the conditions were basically three in number. Firstly, taboos, where they did exist, were unimportant. Everything was open to thought and analysis; forbidden ground hardly existed ¹⁷. Secondly, and of equal importance with the next following factor, there was no strongly-organised religion. Organised religion, with its body of priests forming a separate and powerful group in society, constricts the free flow of analytical and critical thought. Secular knowledge can easily become sacrilege; expansion of thought is constrained. "Without a regular

16. Ibid., p. 72

17. Here, though, one must be careful not to concede completely untrammelled freedom of thought right through the classical Greek period: one may instance the experience of Anaxagoras.

priesthood, without ecclesiastical courts ... religion is deprived of its fangs" ¹⁸. Finally, the Greeks had no Bible. The existence of a Bible, with its 'eternal truths' handed down by some supernatural agency, acts as a most severe inhibition on the free-ranging inquiry of thought. To a fundamentalist religious believer, there is no need to seek for answers; they are all contained in the holy book. The religion of the Greeks was not the religion of a book. There were no written dogmatic assertions which were held to be beyond question. The spirit of Athens was essentially humanistic: as Protagoras held, "man is the measure of all things". In such humanisation, religious terrors had no place. It was "useless to trouble one's mind about the wrath to come, because it was extremely doubtful whether there was anything to come, wrathful or otherwise" ¹⁹.

In connection with the influence of idealist-religious influences, it has been asserted by Laski that "from the time of Calvin not a single work of ultimate literary significance was produced by a resident of Geneva" ²⁰. While this remark could be taken to imply that idealism has had the effect of quenching great literary production, such a view would be untenable. The works of Shakespeare were produced during a period when religion was influential; and the Bible itself contains passages of superb literary merit. The question is more related to freedom of thought than to beauty of expression. It is notable that unorthodoxy has usually been opposed

18. H. Randall, The Creative Centuries. A Study in Historical Development, Longmans Green & Co., London, 1947, p. 17

19. Ibid., p. 25

20. H. Laski, Liberty in the Modern State, Penguin, Middlesex, 1937, p. 157

by the religious orthodox, particularly in the fields of scientific endeavour. The Copernican astronomy, Galileo's exploration of the 'heavens' by means of the telescope, and Darwin's theories of evolution, all met with at least as much fierce opposition from idealist thinkers as were the ideas of the early Greek materialists. It is odd that present-day religious fundamentalists concentrate on attacking Darwin's theories; the Biblical story (Joshua 10, 13) that God caused the sun to stand still so that Joshua could complete a famous victory in battle requires, for any reasonable interpretation, that the sun and planets are arranged according to pre-Copernican astronomy; yet today's fundamentalists seem to have overlooked this fact.

It is impossible, or at the very least, extraordinarily unlikely, in any foreseeable circumstances, that the peculiar conditions existing in the period of the materialist thinkers of Ancient Greece can ever be re-created. Apart from the influence of almost two millenia of entrenched and organised religions of various kinds on the mind of mankind, with consequent channeling of thought and belief, it is clear that there is unlikely to be a world in which another of the factors which strongly influence the course of society will not be significant: that is, complex technology. (As an expression of hope, consideration is here excluded of the science fiction scene - or possibly gruesome fact? - of a remnant of the human race existing in a state of barbarity after a nuclear war.)

In later chapters further consideration will be given to the effects of the advance of technology on society, its beliefs and value systems, and on education. However, before developing this theme, it may be noted that the structure and application of an education system emerge, very largely, from the views held by

dominant sections of the community on the characteristics of human nature itself. Consequently, some attention will now be paid to the influences, both past and present, of various views held on such characteristics.

Chapter 4 INHERENT EVIL

4.1 Education and human nature

Under the influence of various philosophies there have, from time to time, been developed alternative views on the characteristics of human nature. And the "first and most fundamental assumption in every type of educational system is concerned with the nature of the human being"¹. Man may be regarded as being inherently evil or predisposed to evil; or as inherently good; or as being neither inherently good or bad, that the habitual behaviours that are regarded as representing human nature are learned and evaluated in social settings, transactionally; or that the nature of people necessarily and rigidly divides them into those who are inherently superior and those who are inferior². Each of these views has its effect on education. The first and the last of these will be considered, as these would appear to be views which may have the most retrogressive influence on education.

4.2 Evil human nature

The idealism of early Christianity largely accepted the view that man is inherently evil, or predisposed to evil; that only the soul could be regarded as admirable; and that matter, including the human body, was base and worthless. An expression of this view was

1. J. N. Wales, Prologue to Education, Routledge & Kegan Paul, London, 1979, p. 56

2. These categories are dealt with at some length in C. D. Marler, Philosophy and Schooling, Allyn & Bacon, Boston, 1975

seen in the conclusions of Pope Innocent III when he said that man is made of dust, of mud, of ashes; worse yet, of the foulest seed; conceived in the itch of the flesh, in the heat of passion, in the stench of lust; and worse, in the depths of sin; born to labor, to dolor, to horror; more miserable still, to death. He acts wickedly, offending God, offending his neighbor, offending himself; he acts infamously, polluting fame, polluting conscience, polluting character; he acts vainly, neglecting the serious, neglecting the useful, neglecting the necessary. He is food for fire ever blazing and burning unquenched; food for worms, ever gnawing and eating without end; a mass of putrescence, ever noisome and horribly foul...³.

The doctrine of original sin, that Adam, through sin, estranged humanity from God, has had a powerful influence, not only on man's view of himself as a 'miserable sinner' who can attain a state of grace only by supernatural intervention, but also on educational practice.

The view of man being inherently evil has not been confined to the Catholic Church. A letter from Susanna Wesley to her son John (founder of Methodism) made it clear that the first task in the early education of a child was to destroy the 'self-will' that would be found in the child; it was self-will that was displayed by Adam and led to all the sin and misery in the world ⁴. The God-fearing John Wesley's own prescriptions for the training of children were in similar vein:

Break their wills betimes, begin this work before they can run

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3. C. D. Marler, op. cit., in reference to De Comtemptu Mundi, sive De Miseria Conditionis Humanae Libri Tres, Mique Patrologia Latina CCXVII; Marler's quotation comes from A. Tsanoff, The Nature of Evil, Macmillan, N.Y., 1931. pp. 48-49
 4. J. Cleverly and D.C. Phillips, From Locke to Spock, Melbourne University Press, Carlton, Victoria, 1976, p. 23

alone, before they can speak plain, perhaps before they can speak at all. Whatever pains it costs, break the will, if you would not damn the child. Let a child from a year old be taught to fear the rod and to cry softly; from that age make him do as he is bid, if you whip him ten times running to effect it. If you spare the rod you spoil the child; if you do not conquer, you ruin him. Break his will now, and his soul shall live, and he will probably bless you to all eternity ⁵.

Rather oddly, Wesley also noted as one of the 'spiritual diseases' of man, "a want of mercy". The aim of early training was, according to Wesley, to make children realise that

they are fallen short of that glorious image of God, wherein they were first created; that they are not now, as they were once, incorruptible pictures of the God of glory; bearing the express likeness of the wise, the good, the holy Father of spirits; but more ignorant, more foolish and more wicked, than they can possibly conceive ⁶.

His regulations for a girls' boarding school were spartan: the girls got out of bed at 4 a.m., summer and winter * to spend an hour in religious exercises. At 5 a.m. they attended a church service, then worked at their school books until breakfast time. After the day's school instruction period, which lasted until 5 p.m., they indulged in an hour of private prayer. At 7 p.m. a further church service was held, and at 8 p.m. they went to bed. No time at all was allowed for play.

5. Loc. cit.

6. Loc. cit.

* Even servants were to be treated somewhat better than this, according to Mrs. Beeton's Household Management. The servants were to rise an hour later in the winter than in the summer. There was, of course, some aspect of shrewd calculation in this: rising too early in winter, she pointed out, wasted candles.

The celebrated Dr. Arnold of Rugby School was equally convinced of the inherent capacity for evil in children, repeating God's stricture on the cities of Sodom and Gomorrah that there would not be found "so many as ten righteous persons in a whole city". The sight of boys gathered together made Arnold think that he saw "the Devil in the midst of them"⁷. The evangelist Hannah More stated in 1799 that it is "a fundamental error to consider children as innocent beings, whose little weaknesses may perhaps want some correction, rather than as beings who bring into the world a corrupt nature and evil dispositions, which it should be the great end of education to rectify"⁸.

A prolific writer of children's books, Mrs. Sherwood, used a similar theme in her works, the most influential and widely-read of which was The Fairchild Family, published in 1818. In this book the nine-year old Lucy Fairchild voiced what was no doubt Mrs. Sherwood's own firm belief about children, when Lucy prayed: "My heart is so vile, so full of sin, that when I appear to be good, even then I am sinning. When I speak I sin, and when I am silent, I sin"⁹. One of the diversions described for the edification of the Fairchild children (and, no doubt, of the fascinated readers) was a visit to a public execution, the purpose being to impress on the children the end result of giving rein to their natural, evil, impulses.

That similar influences have been active in more recent days is

7. Ibid., pp. 24-25

8. W. H. G. Armytage, Four Hundred Years of English Education, Methuen, London, 1973, p. 72

9. Loc. cit.

supported by my own recollections of my earliest school days in a Seventh Day Adventist school. My most vivid recollections of early reading lessons are of a school book which illustrated, in horrifying detail, various punishments to be meted out to sinners by the Almighty, including one very clearly-remembered picture showing a great crowd of people running around in terror, and being burned alive 'in the last days' by a shower of flaming meteors sent from Heaven. Even at the age of five or six I was somewhat bemused by the juxtaposition, on the facing page, of the statement "God is Love". That was about sixty-four years ago, but the continuing tendency for religious persons to use such methods with the very young is evidenced by the recent experience of my grand-daughter, who attended a Catholic school for a while when she was six years old. She asked to be taken away, on the grounds that "It's not right for people to frighten little children with horrible stories about the Bible".

4.3 Secular application of the doctrine

While such treatment of children, based on supernaturalism, and expressing one aspect of idealism, is most likely to be found in church schools, yet there is another aspect of the same basic belief seen in the practices of many other schools. This is seen in the persistence of the view that school pupils must at all times be kept rigidly in check and their natural (evil) propensities rigidly curbed; that (to borrow Popper's terminology) the 'herdsmen and watchdogs' must exert a very strict control over the 'cattle'. In a great many schools, regulation is piled on regulation; and the curriculum is so tightly prescribed "as to minimize opportunity for (instinctively sinful) student expression"¹⁰. At least until a

10. C. D. Marler, op. cit., pp. 69-70

few years ago, regulations for girls' dresses were set out in minute detail: skirts were to come within a certain distance of the ground when kneeling, etc. (Of course the girls hitched their tunics higher as soon as they were out of sight of the 'girls supervisor'.) In one high school of my acquaintance, the type and brand of the girls' panties were prescribed. Such multiplication of regulations, particularly when they have been devised, as is usually the case, without any consultation with the students, merely brings the whole notion of regulation into disrepute.

4.4 Pupil alienation

It is no secret that many young people are hostile to school. A long letter in the newspaper The Australian of 30 August 1982, from a Western Australian teacher of some thirty-five years' experience pointed out that many teachers "especially those under 30, suffer greatly from insolent students". His solution was to expel the disruptive students, obliging them (presumably if within the age of compulsory attendance) to enrol in another school at least ten kilometres away. It was hoped that the resulting disorganisation of family life, in obliging parents and child to rise earlier in the mornings so as to cope with the extra commuting problem involved, would cause parents to "tighten up on their offspring". By transferring the problem to another school and by arousing hostility in the parents, it may be doubted that the problem of alienation would be solved. Later news from Western Australia indicates that part of the suggested solution has indeed been officially adopted, that is expulsion of recalcitrant students who, however, are over the

age of compulsory attendance; they are not to transfer to another school, but will be allowed to complete their education by correspondence.

Unruly pupils do not in any way regard the school as 'their' institution. Alienation takes many forms, perhaps the most dramatic being a somewhat extreme form of de-schooling, namely burning the school down; this occurs in New South Wales with alarming and expensive frequency ¹¹. Most of these fires are started by present and past pupils. A large number of pupils are less dramatic in their opposition; and a sizeable proportion submit passively to authoritarian attitudes as a way of getting through the school years with as little 'hassle' as possible.

Schools are not usually democratic institutions; they are more likely to exhibit features of dictatorships, sometimes benevolent, but dictatorships nonetheless, on which the shadow of Platonism, even if not acknowledged, is cast. "Whenever anyone asserts that the cure for our problems is that we should be ruled by those who really know what is best, then he is asserting the essence of Plato's theory" ¹². In some cases Principals have set up school councils of pupils in high schools, these councils being charged with the task of making suggestions for the running of the school in a manner more satisfactory to the pupils. Most often the activities of these councils are charades. It would be an unusual school in which the students are encouraged, or even allowed, to take action on any

11. N.S.W. Teachers' Federation, Education (journal) Vol 63 No. 14, August 16, 1982: "In recent months fires in the west of Sydney have caused damage to school buildings in excess of \$2 million ... Nearly 40 school fires have been started in the past three months and many have caused serious damage".

12. L. Stevenson, Seven Theories of Human Nature, Oxford University Press, N.Y., 1974, p. 23

important matter; their advice is welcomed on peripheral and trivial matters, such as some detail of dress or the organisation of a school dance, none of which is likely to threaten in any way the power structure of the school, or the status positions of the school 'establishment' figures.

In some schools in which the 'prefect' system (copied from English private schools) has been installed, I have known of cases in which, although pupils were supposed to elect the prefects, staff members did not hesitate to falsify the results so that pupils favoured by the staff purported to be elected, and non-conformists were excluded. In general, non-conformity is regarded as 'trouble-making' to be eliminated - even in some cases from the routine of class teaching. It is only a couple of years ago that a bright and well-mannered young woman who was in Year 12 (final year) of a high school remarked to me that neither she nor any other member of her class felt free to ask questions of her teacher, particularly questions which might seem to cast some doubt on the validity of a statement made by the teacher.

Unfortunately little, if any, leadership is given from the top echelons of the state education system (in New South Wales, at any rate) in the matter of developing a democratic system in the schools. Teachers are often in no better position, vis-à-vis their superiors, than are the students. I have sat through many a so-called 'staff meeting' in high schools, which bore no resemblance to the generally-accepted format of a meeting. They consisted almost entirely of the issuing of a series of edicts from the principal. And, to go right to the top, it was only a few years ago that Mr. Eric Willis, then the Minister of Education in New South Wales, stated publicly that "the only duty of a teacher is to obey the instructions

of his superiors".

In view of the lack of training of school pupils in the gaining of experience in judicial, executive and legislative decision-making it is the essence of naivety for concerned members of the staffs of tertiary institutions to bemoan the apathy of tertiary students in regard to the taking of responsible positions on committees. Each year, to take a local example, there are elections for student representatives on all faculty committees at the University of Wollongong. It is never the case that all positions are filled, even when staff members personally urge students to offer themselves for election. Such a situation is not surprising; it would indeed be surprising if students who had spent about thirteen years of the most formative period of their lives in institutions where training for responsibility was minimal or, in most cases, non-existent, were suddenly to blossom out as fully-active members of a democratic, decision-making community.

4.5 Education and democracy

Is it, then, possible to alter this situation? To put forward the desirability of altering it, and the possibility that pupils should be given training in significant decision-making is, of course, to take the view that the task of the school includes more than the injection of cognitive knowledge - more than the 'training of the intellect'. Such a view assumes that, as well as turning out scholars, schools should produce people who are also fully prepared to enter the adult world as active participants in a dynamic democracy.

None of such claims would imply that pupils should run the

school. Abdication of staff or administration from their responsibilities would not advance the effectiveness of education.

A sound education requires informed adults to transmit knowledge, focus questions, stimulate debate, supervise controlled experience, offer feedback and evaluation, and in myriads of other ways facilitate student growth. It is inconceivable that such leadership could be accomplished if either teacher or administrator is reduced to flunky roles ¹³.

Nor would it be advisable, or even possible successfully, to introduce a system of student democracy overnight. Effective democracy involves training in responsibility. The production of students who would be ready, when they left school, to act as involved citizens in the larger democratic society probably needs far more careful planning than does the successful pursuing of a mathematics course which is to run from kindergarten to twelfth year. Pearl suggests a graduated method for developing responsible involvement ¹⁴.

In the early primary grades the teacher would be wholly in charge. The teacher's role, in these early days, would be primarily didactic. Explanation would be given for the necessity of rules and an understanding built concerning occasions in which the rights of one individual begin to interfere with the rights of another. By means of role-playing and simulation, the very young could develop a sense of the parameters of democracy. By fourth year the students should be allowed to experiment with representative government. From here, in the intermediate grades, pupils should be randomly assigned to various functions. Thus every child, not only the

13. A. Pearl, The Atrocity of Education, New Critics Press, St. Louis, Missouri, 1972, p. 138

14. Ibid., pp. 136-138

popular or the 'pushy', would gain experience as legislator, in deliberating on what should be done with rule violators, and in understanding that freedom carries responsibility. The teacher's role would be active: assisting students to consider the possible consequences of their actions, encouraging them to try again if a student activity became a shambles, restoring a sense of humour if the students became depressed, mitigating possible authoritarian behaviour.

The 12 to 15-year-olds would now be prepared to experiment with elections, to nominate candidates, campaign, and vote. Students should be involved in judicial proceedings only if they have initially been consulted in the formation of rules. The teacher's role would become that of a review authority. Any restrictions should be announced in advance. "The major function of the teacher is to return to the students, for re-consideration, actions which are internally inconsistent, which fly in the face of student rights, or which can be proved to lead to disastrous consequences" ¹⁵.

Older students should have matured to a point where they would be of significant influence in the running of the school. Rights, as well as responsibilities, would be clearly established. A wise works manager of my acquaintance once remarked that the essence of good personnel relations consists of ensuring that no change should ever be made which will affect any person unless that person has first been consulted. In consonance with the principle, Pearl extends the consultation to include significant adults, including

15. Ibid., pp. 137-138

those who may be outside the school:

Before launching into a venture where power is shared with students, those who are to do the sharing must fully understand what is expected of them. The teacher, the board, and other significant adults should convene for a probing discussion of the implications and possible consequences of enhanced student power prior to embarking on the adventure. If the adult authorities are in disagreement, these differences should be resolved in advance of the undertaking (or the undertaking may have need for an undertaker) ¹⁶.

In the New South Wales context one would substitute for "the board" officials of the local area office; and full consultation with the local Parents' and Citizens' organisation, or community school council would also be essential. In the case of private schools a different determination would need to be made about who were the 'significant adults' who would need to be consulted. The above notes set out what might be regarded as a theoretical prescription for education in democratic practice. In Chapter 8 reference will be made to a fairly large Australian school in which such a prescription has been successfully applied, as a formally-organised system ¹⁷.

It may quite justifiably be pointed out that none of the suggested programme of action is new. That is true; such arrangements have been written about many times in many places. But it is equally true that very few schools have considered the matter seriously; in a few privately-run 'alternative' schools some application of the principle is usually attempted, but not in any formally-organised manner.

16. Ibid., pp. 139-140

17. Melbourne Church of England Girls' Grammar School.

The key figures in any such programme would undoubtedly be the school principals. The task of re-orienting the thinking of men and women who have spent the major part of their working lives in a non-democratic atmosphere would be formidable. Some would never make the adjustment; failures would therefore occur, which those responsible for the difficulties would inevitably blame on the new system. The time-scale of the necessary re-education campaign designed to alter the thinking of senior personnel in the schools would have to be visualised in terms of at least five years in the most favourable circumstances, and much longer in some cases. The ingrained philosophy of a lifetime is not altered in a short period. I suspect that the task of persuading central office bureaucrats of the desirability of the suggested changes would be far easier than that of persuading school Principals. To those who are in daily contact with difficulties, the problems loom larger than for those who are somewhat removed from the firing-line.

Where should the campaign start? Laski remarked that new truth "begins always in a minority of one; it must be someone's perception before it becomes a general perception"¹⁸. But as remarked above, the perception of the desirability of introducing democracy to schools is no longer confined to one person; it is not the perception that is lacking, but the application. Prolonged agitation by a group of (probably young) teachers would be required in the initial stages. If such a group could be persuaded to campaign through all the organs of the New South Wales Teachers' Federation, and be prepared to persist for up to ten years, then success could

18. H. Laski, op. cit., p. 97

be assured. After all, it was not much more than ten years ago that Jack Munday and his Builders' Labourers' union commenced a campaign in Sydney to save pockets of remaining bushland and historic buildings from the bulldozers. They were, for quite some time, regarded as 'radical rathags'. Yet their persistent campaigning altered the thinking of almost an entire community.

It is interesting to note that the idea that pupils should take responsibility in organising school matters is not one that has germinated only recently. In 1752 William Gilpin became headmaster of the English private preparatory school Cheam (which operates on its original site to this day). For the following twenty-eight years he "banished the birch and appointed a jury of the boys to enforce school rules and fine those who broke them ... the boys collected the fines ... the money was spent on buying cricket bats, library books, seats in the playground, and fives courts" ¹⁹.

Evidently it was possible, even some 230 years ago, for some few to discard the philosophy that supports the view that naturally evil young human beings must be rigidly controlled at all times.

A study undertaken in Australia in 1978 for the Committee of Inquiry into Education and Training indicated that, while New South Wales high schools were seen by their students, and by the parents, as coping successfully with the task of inculcating skills

19. W. H. G. Armytage, op. cit., p. 62

in the 'basics', yet they did rather poorly in equipping students with the knowledge and skills they needed in order to cope with the demands of adult life ²⁰. A second study, Looking Backward (Schools Commission 1980) extended the investigation ²¹. A general conclusion was that "secondary schools tended to perceive students through the tunnel vision of academic prowess ... only the academically successful had liked school, had come to know teachers, or had felt valued by them" ²². In passing, and in view of a tendency noted in some quarters to urge the substitution of teachers by technologically-advanced equipment, it is salutary to note that "a meaningful person-to-person relationship with teachers was the crucial process factor, making for or making impossible an acceptable school environment" ²³.

Earlier remarks made in this chapter concerning the importance of training students for participatory responsibility are supported by a further conclusion, made as a result of the survey:

Most respondents felt that schools tended to regulate what happened on the premises by arbitrary rules handed down from above and by enforced punishment. They saw maintaining order by these means as authoritarian and inappropriate to the needs of young people who, growing towards adulthood, need to develop self-discipline and a sense of responsibility from an order co-operatively arrived at ²⁴.

In view of an impression sometimes gained from the popular press that employers are, in general, in favour of a restrictive atmosphere om schools, in order that leaving students will be obedient and docile,

20. The study, Expectations of Secondary Schools, conducted by Collins and Hughes, is briefly surveyed in their booklet Where Junior Secondary Schools Are Heading, Australian Council for Educational Research, Australian Education Review No. 16, Hawthorn, Victoria, 1982.

21. Also reported in ibid.

22. Ibid., p. 17

23. Ibid., p. 18

24. Ibid., p. 19

it is interesting to note a further conclusion of the study, that it was only a couple of employers who themselves run very authoritarian firms that expressed this view. "Employers who had built some degree of worker participation into the structures saw the schools as behind in their 'managerial relations'" ²⁵.

25. Loc. cit.

Chapter 5 INEQUALITY

5.1 The superior and the inferior: schooling and work

In considering the view that the nature of people necessarily divides them into those who are inherently superior and those who are inferior, we hear again an echo of the Platonic belief in a natural distinction between the rulers and the ruled. For a considerable period in the history of education, this view prevailed. The influential Locke, whose book Some Thoughts Concerning Education, published in 1693, went through fifteen English editions by 1777 and greatly influenced eighteenth century educational thought, was convinced that "mental culture was not for men of low condition"¹. His prescriptions for the education of an elite carried insights quite different from the harshness of a John Wesley: punishments were not to be used; learning "should be made easy and pleasurable and based on activity and curiosity rather than dictation and authority; and it should be inspired at all times by affection, not fear"². Harsh authoritarianism was, however, too traditionally ingrained in those who controlled schools for his dicta to have much immediate influence; the pattern continued to be rote learning and flogging. Despite his forward-looking views on the treatment of those children who were considered to be of superior clay and therefore educable, it apparently did not occur to Locke, as it did to his great contemporary, Comenius *, that all children could, and should, be

1. J. Lawson,⁴ H. Silver, A Social History of Education in England, Methuen, London, 1973, p. 175

2. Ibid., p. 176

* Locke was 28 years old when Comenius died.

educated.

While the children of the wealthier classes were educated in private schools of various kinds, from which they could be expected to move to positions of influence and affluence in the community, education for the lower orders in the late seventeenth and the eighteenth centuries in England consisted largely of child-minding in such institutions as Dame Schools and Charity Schools. Stone gives an example of a Dame School catering for thirty-one children in a cellar ten feet square. The main purpose of such 'schools' was to keep the children occupied and off the streets while the 'labouring poor', their parents, were at work. The 'teachers' were "usually poor old women who would otherwise have been a burden on the poor rates, and the most that could be expected of them was to teach their charges to read a little and to knit and sew" ³.

The effects of the belief that the children of the poor were of inferior human quality were not confined to their schooling; this belief also found strong expression in the wider concerns of society, in particular, employment. These children were regarded by the rich and powerful as expendable; one example is given by the horrifying treatment of the 'climbing boys' (little chimney sweeps). It is notable that all parliamentary Bills aimed at ameliorating their conditions were thrown out by the House of Lords. Some of these children started work as young as four or five years; most at six to eight years. They worked in conditions of extreme misery and terror. In order that they be forced to climb into the pitch-dark

3. L. Stone, op. cit., p. 113

chimneys, pins were stuck into their feet or fires were lighted under them. Some flues, only seven inches square, required the services of tiny, naked children. Many were suffocated, or, losing their way in a maze of chimneys in some mansion, were burned to death in flues leading from fire-containing hearths ⁴.

Even in the nineteenth century a similar attitude persisted, of those who regarded themselves as superior towards those who were regarded as inferior. In 1842 the First Report by the Commission on the Employment of Children and Young Persons detailed the conditions of children - boys and girls - as young as five years of age employed in coal-mines in England. Hours of work were usually fourteen hours a day: 6 a.m. to 8 p.m. Apart from employment as 'trappers' who, working the fourteen hours in isolation and complete darkness, opened and closed ventilation doors to allow passage of skips, they also worked as 'fillers', loading the skips. They also worked as beasts of burden, pulling the skips from the miners to the foot of the shaft: "A girdle is put around the naked waist, to which a chain from the carriage is hooked and passed between the legs, and the boys crawl on their hands and knees, drawing the carriage after them" ⁵. Girls received precisely similar treatment.

As with practically every ameliorative demand through the history of industry, a drive for the elimination of child labour from the pits was met with the claim that any such change would bring ruin

4. J. L. and B. Hammond, The Town Labourer 1760-1832, Vol II, Guild Books, The British Publishers Guild Ltd., London, 1949, pp. 13-17

5. Ibid., p. 8

to the proprietors. One may note also that these owners, "men of great power and influence, men like Lord Londonderry, Lord Durham, Lord Melbourne, Lord Granville", while disclaiming all responsibility or concern for the conditions in their pits, "did not wash their hands of the business that made their wealth, for they took an active part in putting down strikes and crushing trade unions" ⁶.

The belief, among the self-styled 'superior' orders, in the divinely-ordained division of the human race into the 'superior' and the 'inferior', shaped the entire attitude of the wealthier classes towards the education of the poor. The provision of "too much education" among the lower orders was seen as a threat to the position of the wealthy. Bishop Beilby Porteous of London, in an oft-quoted remark, said in 1803 that "Men of considerable ability say that it is safest for both the government and the religion of the country to let the lower classes remain in that state of ignorance in which nature has originally placed them" ⁷.

The religious training of the poor was, however, regarded as being of great social importance. Its purpose was to communicate to the lower orders "the elements of a cheerful and uniform submission to all lawful authority" ⁸. Platonism certainly cast a long shadow! Under the aegis of church people, general education had the same aim. The Sunday Schools, which educated children at minimum expense (one shilling per year) had as the themes of education the inculcation of "the fear and love of God, a regard to His holy

6. Ibid., p. 11

7. Quoted in U.S. Office of Education, Education in England, Washington, D.C., 1960, p. 19

8. P. McCann (ed), Popular Education and Socialization in the Nineteenth Century, Methuen, London, 1977, p. 1

day; duty to Parents, submission to Masters and Teachers, and obedience to Governors" ⁹.

5.2 Monitorial schools

Another, and important type of school designed for the children of the inferior orders was the monitorial school. This was an exemplar of the method of producing docile, disciplined factory hands for, as an example, the textile millowners during the early 1800s. The organisation of such a school followed closely the organisation of the mills into which the pupils would be most likely to graduate. A family which had previously carded, spun, woven, washed and bleached the fabric materials was now working away from home, and its members were no longer able to carry on their day as a self-initiating productive unit, but were scattered, submitting to a rigid timetable and to discipline designed to extract maximum production from every minute. Penalties were exacted for absenteeism or for behaviour that, in the eyes of the mill-owners, might distract a worker from complete concentration on the job. Accordingly,

in mill after mill placards were up with such rules as 'Any person leaving their work and found Talking with any other work-people shall be fined 2d. for each offence', and similarly for 'Talking with anyone out of their own Ally', or 6d. for 'talk-
ing to another, whistling, or singing'¹⁰.

It is a matter for some wonder that the workers would have found any occasion for whistling or singing. In the case of an absentee, his machine being unmanned for the day, he was fined the cost of the

9. Ibid., p. 11

10. Quoted by David Craig, Introduction to Dickens's Hard Times, Penguin, Middlesex, 1969, p. 18

coal required to raise the steam to run the machine.

The monitorial school was close to the hearts of the mill-owners, being organised like a factory, and disciplining the young into strict obedience by means of harsh penalties.

In the Manchester Lancasterian School a thousand children were taught in one huge room, controlled by a kind of military drill with monitors and a monitor-general, and taught by methods derived from the Catechism. Groups of facts, mechanically classified, were drummed in by methods that might have been meant to squash forever the children's urge to find out or understand anything for themselves ... There were the closest links between heartless schooling and worse than heartless factory discipline ¹¹.

Lancaster's own description of punishments meted out to any child who did not conform to the rigid rules of the establishment may seem atrocious today, but the governing classes were most impressed by "the orderliness that prevailed" ¹². Lancaster, a Quaker who stated that "reading is not a study, but a medium of religious or moral instruction" ¹³, listed the following 'Offences and Punishments':

In my school talking is considered an offence ... Each monitor ... has a number of cards, written on differently; as, 'I have seen this boy idle' - 'I have seen this boy talking', etc. etc. ... This card is given to the defaulter, and he is required to present it at the head of the school ... the lad to whom he presents the card has liberty to put a wooden log around his neck ... This machine may weigh from four to six pounds ... It is common to fasten the legs of offenders together with wooden shackles... Should not this punishment have the desired effect, the left hand is tied behind the back or wooden shackles fastened from elbow to elbow, behind the back ... Occasionally boys are put

11. Ibid., pp. 22-23

12. Ibid., p. 24

13. J. Lancaster, Improvements in Education, as it Respects the Industrious Classes of the Community, London 1805, quoted in S.Cohen (ed) Education in the United States. A Documentary History, Vol 2, Random House, N.Y., 1974, p. 897

in a sack, or in a basket, suspended to the roof of the school ... Frequent or old offenders are yoked together sometimes, by a piece of wood that fastens round all their necks: and thus confined, they parade the school, walking backwards ...¹⁴.

Lancaster claimed to have invented "under the blessing of Divine Providence, a new and mechanical system of education". His rival, the Anglican Andrew Bell, who devised a similar system, called his "the STEAM ENGINE OF THE MORAL WORLD"¹⁵.

5.3 Twentieth century notions. Jensenism

The latter part of the twentieth century has seen a weakening in the belief in the inalienable right of elites to regard the lower orders as having been placed irrevocably in their inferior position by divine dispensation. Accompanying this change has been a vigorous debate about the desirability, and the practicability, of the provision of equal educational opportunity for all. This change of mind has not, however, occurred universally. One school of thought, represented by the psychologist Jensen, has reinforced, particularly in the United States of America, the centuries-old belief in the in-built superiority of a certain section of the population and the natural and irremediable inferiority of another section. In this case the cause of the phenomenon is not now ascribed to a direct edict of God. For the direct divine decree there has been substituted a more sophisticated variety, a more subtle arrangement of genetically-determined inferiority. The argument does not now involve the superiority

14. D. W. Sylvester (ed), Educational Documents 800-1816, Methuen, London, 1970, pp. 280-281

15. D. Craig, op. cit., p. 23

and inferiority of economic classes in the community, but involves the innate abilities of members of different races.

Professor A. R. Jensen, of the University of California, marshalled an impressive array of evidence which he interpreted as showing that (1) intelligence, as measured by I.Q. tests, is mainly (about 80 per cent) genetically determined; (2) black Americans score, on the average, about fifteen points below whites; (3) this racial difference in intelligence is attributable mainly to heredity and not to environment; and (4) compensatory educational programmes, aimed at minimising the educational difficulties of minority groups (and based on the premise that students from minority backgrounds possess innate, or potential abilities equal to those of white students) are a waste of time, energy and money ¹⁶.

Such findings may, of course, be found to be well-based. Doubt has, nevertheless, been thrown on the validity of the work on which Jensen based his findings, for instance by Professor Hirsch of the University of Illinois ¹⁷. Hirsch wrote of "the Jensen disgrace" that has "hoodwinked large segments of government and society". He quoted examples of Jensen's lack of accuracy in quoting from his source material, and of distortions of graphs in order to strengthen his case: in the original of one graph "the maximum difference between graphed coordinates is shorter on the ordinate than on the abscissa, whereas in all the Jensen-Robinson

16. A. R. Jensen, "How Much Can We Boost IQ and Scholastic Achievement?", Harvard Educational Review, Vol. 39 No. 1, Winter 1969, pp. 1 - 123

17. J. Hirsch, "Jensenism: The Bankruptcy of 'Science' Without Scholarship". Educational Theory, Vol 25 No. 1, Winter 1975

so-called reproductions this relationship has been reversed ... Also Thompson's original has only 11 steps on the ordinate scale, each 20 units apart, whereas in the Jensen-Robinson distortions the ordinate scale has been stretched and 'improved' to show 17 steps, each 10 units apart. The point at issue is scholarly integrity" ¹⁸. Other examples of 'distortion' of original references were given by Hirsch: "Jensen's misrepresentations are legion" ¹⁹, including an example such as Jensen's quoting of researchers who, according to Jensen, "studied the families of 88 low economic class Negro mothers" when the original authors stated that they had "studied the families of 88 low economic class mothers"; nothing in the original report identified the race of the families ²⁰. Hirsch has detailed a number of other examples of Jensen's misquotation from original sources, as well as errors in biology.

Professor Kagan of Harvard University threw further doubt on Jensen's thesis:

Arthur Jensen's essay on IQ, scholastic achievement, and heredity contains a pair of partially correct empirical generalizations wedded to a logically incorrect conclusion ... the logically faulted conclusion that there are genetic determinants behind the lower IQ scores of black children. The error in his logic can be illustrated easily, using stature as an example. There is no doubt that stature is inherited. Height is controlled by genetic factors ... Indian children living in the rural regions of most Central or South American countries are significantly shorter than the Indian children living in the urban areas of those countries. Jensen's logic would suggest that the shorter stature of

18. Ibid., p. 13

19. Ibid., p. 14

20. Ibid., p. 15

the rural children is due to a different genetic constitution. However, the data indicate otherwise ... [not] due to heredity but to disease and environmental malnutrition ... The essential error in Jensen's argument is the conclusion that if a trait is under genetic control, differences between two populations on that trait must be due to genetic factors. This is the heart of Jensen's position, and it is not persuasive ...²¹.

Kagan quoted further studies on the IQ of identical twins reared in different environments; the average IQ difference for pairs of identical twins was fourteen points, and for at least a quarter of the cases the difference was larger than sixteen points, that is, greater than Jensen's quoted difference between black and white populations²².

5.4 Compensatory education. 'Head Start'

On the question of Jensen's dismissal of the value of compensatory education, Kagan pointed out that the value of 'Head Start' or other compensatory programmes had not been accurately assessed. The view that it is reasonable to expect a permanent improvement in IQ score after eight weeks of a Head Start programme would be as nonsensical as expecting that feeding animal protein to a seriously malnourished child for several days would lead to a permanent increase in weight and height, if after the brief interval of feeding him properly he were sent back to his malnourishing environment²³.

Professor J. McV. Hunt, of the University of Illinois, brought

21. J. S. Kagan, "Inadequate Evidence and Illogical Conclusions", Harvard Educational Review, Vol.39 No 2, Spring 1969, pp.274-275

22. Ibid., p. 275

23. Ibid., p. 276

further doubt on Jensen's standpoint. He pointed out that bodily changes occur as a result of experiences, that

the consequences of informational interaction with circumstances, through the ears and the eyes (and especially the latter for the evidence extant) is quite as biological in nature as the effects of nutrition or of genetic constitution. Interaction through the eyes, especially early in life, has genuine neuro-anatomical and neurochemical consequences ²⁴.

He detailed irreversible physical defects induced by early rearing in environmentally-deficient surroundings. He regarded Jensen's statement that "compensatory education has been tried and it apparently has failed" (this was the opening sentence in Jensen's article) as a dangerous half-truth. It is, he suggested,

a half-truth which could halt support for research on how to foster psychological development, for the development of technology of early childhood education, and for the deployment of that technology across the USA. Insofar as it succeeds in boosting these forces of reaction, it will leave the issue open only for debate. Once the support for investigation, development, and deployment has been removed, the differences between our readings of the evidence will no longer be open for 'investigation' ²⁵.

In any case, according to Professor Hunt, because of the traditional development of nursery school education, Head Start was not synonymous with compensatory education: it consisted merely of 'free play'. Traditional play school "has little to offer the children of the poor, but programs which made an effort to inculcate cognitive skills, whether they be taught directly or incorporated into games, show fair success. A substantial portion of this

24. J. McV. Hunt, "Has Compensatory Education Failed? Has It Been Attempted?", op. cit., p. 285

25. Ibid., p. 296

success endures", especially if the parents are drawn into the process ²⁶. It would thus appear, from the evidence and discussion, that Jensen's idealist contention that certain (racial) sections of the community are inherently inferior to other sections, is at least, 'not proven'.

5.5 Women and inequality

A further section of the population, comprising about half of the human race, has long been regarded as being naturally inferior: women. This view has had a long-lasting and deleterious effect on the education of girls. Even in the enlightened conditions of Ancient Greece, women occupied a subservient position:

So long as a woman remained unmarried, she stood under the authority of her father or some other male relative. A married woman passed into the power (Lat. manus) of her husband; a widow might 'belong' to her son ... She owned no property save her strictly personal outfit; and if she was furnished with a dowry, this passed into her husband's keeping. If she did not satisfy her husband, she might be returned to her family, or transferred to another husband ²⁷.

The long tradition of the inferiority of women later crystallised by the Christian church, was well documented in the Old Testament. Starting with the belief that the first woman was fabricated from a rib of a man, and that the woman tempted the man to commit an evil deed, the disparagement of women continued. In the record of the first census, women were not counted ²⁸. A double standard for the sexual behaviour of men and women was early established. An accusation by a man concerning his wife's suspected sexual infidelity was

26. Ibid., p. 297

27. M. Cary and T. J. Haarhoff, Life and Thought in the Greek and Roman World, University Paperbacks, Methuen, London, 1968 reprint, p. 142

28. Bible, Numbers, Chapters 1, 2 (King James Version)

to be judged by a priest. The woman would be given holy water mixed with dust to drink; if she were guilty her belly would swell and her thigh putrefy. The husband was to be considered blameless²⁹. Women were regarded as unclean for a week after the birth of a son, but a fortnight if the baby were a girl; in order to 'atone' she was to make a 'sin offering' to a priest³⁰. A menstruating woman was regarded as being unclean, as would be anyone who touched her. After eight days she was again to make 'at-onement' by making a 'sin offering'. In a scale setting out the monetary values of persons, to be used in calculating levies associated with religious vows, women were regarded as being worth less than men - for example, a person aged between twenty and sixty years was evaluated at fifty shekels of silver if a male, but only thirty shekels if a female³¹.

In the Christian church, the idealist attitude to the body as being, as part of matter, inferior to the spirit, found its expression in a vigorous deprecation of sexuality, and in the relegation of women to an inferior status. Sexuality was regarded as a phenomenon found only in a sinful world; in Heaven there would be no sex. The kingdom of God was to be no place for the degrading appetites of the flesh. Even a sexually desirous glance provides cause for entrance into hell³². The downgrading of sex leads to a down-grading of women, even a hostility. According to Paul, women should be avoided, and not even touched³³. Marriage is for the

29. Op. cit., Numbers, Chapter 5

30. Op. cit., Leviticus, Chapter 12

31. Ibid., Chapter 27

32. Op. cit., New Testament, Matthew V, 28,29

33. Op. cit., Corinthians VII, 1

weak; it would be better if no one married ³⁴.

There was to be no doubt about the inferior status of women.

"Let the woman learn in silence and with all subjection. But I suffer not a woman to teach, nor to usurp authority over the man..."³⁵.

Women were to be "discreet, chaste, keepers at home, good, obedient to their own husbands..."³⁶. Women's place was, very early, in the home. Many of the Church Fathers gave voice to an attitude of complete hostility to women:

Tertullian's defamatory view of women is clearly revealed by his calling her the 'gate through which the devil enters' ... Jerome, who was responsible for the Latin translation of the Bible, the Vulgate, wrote: 'Woman is the gate of the devil, the way of evil, the sting of the scorpion, in a word, a dangerous thing' ... He was convinced that married people lived 'like cattle' with each other and were in no way different from 'pigs and irrational animals'³⁷.

The denigration of sex and of women possessed of sexuality has been made a central part of some religion, in the cult of the Virgin Mary. According to Augustine, sin is inherited physically, by way of the sexual act; that is why Jesus had to be born of a virgin. If he had not been, he would have been sinful ³⁸. The story of the Christian attitude towards women and sexuality is widespread; it had roots in Protestantism as well as Catholicism.

Luther believed that even within marriage, "sexual intercourse was sinful, since it was always mixed with 'carnal lust' - 'no marital

34. *Ibid.*, 8, 27

35. *Op. cit.*, I Timothy II, 11, 12

36. *Op. cit.*, Titus II, 5

37. J. Kahl, *The Misery of Christianity*, Penguin, Middlesex, 1972 reprint, p. 77

38. *Ibid.*, p. 78

duty takes place without sin' " 39.

One of the most horrifying results of the idealist belief in supernaturalism was the Christian witch-hunt, which reached its peak during the Thirty Years' War. The New Testament taught the existence of devils ⁴⁰. Witches, who were considered to be familiar with devils and demons, were tortured and killed in most cruel circumstances, not only at the behest of Popes, but also of Protestants:

... popes, such as Alexander VI, Julius II, Leo X, Hadrian VI and Clement VII also called upon Christians, in various bulls, to murder innocent women and the leaders of the Reformation did exactly the same. In the sermons that he delivered in Wittenberg, Luther again and again urged his followers to hunt and torture witches, and Calvin, without doubt one of the greatest sadists that ever lived, constantly advocated mass executions in order to exterminate witches ⁴¹.

It was the study of materialism that first brought to an end these vicious practices. Prominent among the translators of the works of Epicurus, who had adopted the materialistic doctrines of Leucippus and Democritus, was Gassendi, a French philosopher born in 1592.

Gassendi "carried out an experimental demonstration which led to the abolition of witch-burning in Catholic France more than half a century in advance of Protestant Scotland" ⁴². According to Hogben, the incident is recounted in Robertson's A Short History

39. Ibid., p. 85

40. Bible, New Testament, Mark VII, 26-30

41. J. Kahl, op. cit., p. 83

42. L. Hogben, op. cit., p. 393

of Freethought Ancient and Modern (Vol. II), and describes the discrediting of belief in witchcraft. It was demonstrated that the administering of a drug to so-called witches and sorcerers produced in them, on waking, the strong impression that they had been to a 'witches' sabbath'. Witnesses testified that in fact they had never left their beds. One result was the over-riding by Colbert in 1670 of a decision of the Parlement of Rouen to burn fourteen people as sorcerers or witches. Instead, orders were given to dose them with a medicine for brain disorders.⁴³

The age-old stereotype of woman as being a second-class person has, many times throughout history, affected the education of girls, and has constricted the view that girls and woman have taken of their own abilities. The Tudor-Stuart period in England, for instance, saw "a continuous controversy about the nature of woman and her proper place in society"⁴⁴. Women were looked on either as delicate companions for protective men, or as seductive and an evil influence on men. It was largely expected that if women were taught to read they would spend their time reading frivolous material, rather than improving their characters by reading religious works. In fact, a statute of 1543 "limited noblewomen and gentlewomen to private reading of the Bible, while women of lower status were specifically forbidden to read it at all"⁴⁵. The growth of Puritanism, with its emphasis on Bible-reading for all, later

43. Loc. cit.

44. N. McMullen, "The Education of English Gentlewomen 1540-1640", History of Education, Vol. 6 No. 2, 1977, p. 87

45. Ibid., pp. 87-88

removed the latter proscription. In order to prepare women for their chief role in life, that is, partners in advantageous marriages, it was considered that they should "learn to read, write, sing, play an instrument well, and acquire some skill in languages"⁴⁶.

Gentlewomen did not attend schools, as did their brothers; they were educated at home, and thus protected from mingling with the 'lower orders', some members of which might have been found in elementary schools. This home education usually came to an end by the age of about thirteen years. By this time, presumably, they would have acquired some competence in reading and writing English, speaking French, and playing on an instrument such as "the lute, virginal, olpharion, theorbo, or viol de Gambo", together with skill in needlework ⁴⁷. Such accomplishments would be sufficient for them to fulfil their prescribed role in life, which was to be useful and ornamental in the homes of their husbands. It would not have been fitting for them to have other career aspirations; they internalised fully the stereotype of occupation suited to a woman.

That such a situation has changed little, basically, is noted by people questioning twentieth-century girls on their occupational aspirations. Girls still see women as being suitable for 'female occupations'. A study of career aspirations conducted in 1979 in Australia revealed that the "overwhelming majority of

46. Ibid., p. 90

47. Ibid., p. 95

both boys and girls at school aspired to occupations which either could be considered to be stereotypic of, or are dominated by, their own sex ... Girls said they wanted to become nurses, teachers and secretaries, and ... to marry and have children" ⁴⁸. The responses of seven year-olds reflected the stereotypes just as much as with the older children, indicating that recent attempts by women and others to alter the community's stereotyped view of the place of girls and women has not yet penetrated far into the schools. A further study showed that those few girls who had broken out of the strait-jacket of stereotyped thinking about careers were aware that, even if their thinking had changed concerning the role of women, yet the thinking of boys and men had not. These girls

believe that they will be in paid employment for most of their lives, combining this with marriage and motherhood. At the same time, the girls believe that they must take complete responsibility for house and family. This is an intolerably arduous situation, and the girls showed their fear of 80-hours-a-week work in essays which described days of exhausting hyperactivity ...

At the same time as girls indicated they believed that they must, when adults, accept overly long hours of work, the boys tested showed little inclination to do any household chores and concurred with the idea that such things were 'women's work' ⁴⁹.

Evidently education on the removal of stereotypes is possibly even more urgent with males than with females!

As well as being affected by the adoption of social stereotypes, males and females of all ages will be affected by the development

48. G. Russel and J. Smith, "Girls Can Be Doctors ... Can't They? , Sex Differences in Career Aspirations", Australian Journal of Social Issues, Vol. 14 No. 2, May 1979, p. 91

49. B. d'Alpuget, "Jobs for the Girls? How Careers Education Can Help", op. cit., p. 109

of modern technology and its control by people who, consciously or unconsciously, are subject to one or another philosophical belief.

The alteration or elimination of stereotypes cannot take place in a social and economic vacuum, merely by means of taking thought. Social consciousness depends largely on industrial and economic conditions and experiences. The drive noted in recent years for equality for women is not unconnected with the availability of domestic technology which freed women from the time-monopolising drudgery of hand-laundrying, of stoking the old-style fuel stove, and the like. It is also partly a product of the availability of industrial technology, in that jobs may now be done by women, using push-button machines, which in earlier times required the greater physical strength of men.

The attainment of social and economic equality, and further, of autonomy - with independence of action and choice - for sections of the community that do not currently occupy positions of power, do not depend solely on the promulgation of ideas. Success is also critically affected by the type of technology generally adopted and by the purposes and activities of those who control society's productive technology. Such technology may be controlled by small groups who use it to maintain their own wealth and positions of power - almost always by means of what may be called 'big' technology. Its use and control, on the other hand, may be widely dispersed, by means of what has been called 'intermediate technology', or 'technology on a human scale'.

The effects of these alternatives are different. With centralised control of 'big' technology there is little or no room for spontaneity, for the potential whims or choices of people. All

processes must be rigidly planned and controlled. The influence of the "long persistent tradition of the Judeo-Christian interpretation of the world" is discerned here by Otto Ullrich:

The Judeo-Christian search for God's scheme of salvation was continued in the sciences when theological methods ceased to yield satisfactory results ...the divine scheme was not only to be known to the scientist, but it was to be completed by humanity. And this scheme could not be ambivalent ... it had to be unequivocal, the only correct and reasonable one, as befits a divine plan. The ideology of 'the only best way' is at the basis of all 'scientific' social models and of all technocratic planning concepts ⁵⁰.

It would be injudicious to attempt to isolate one factor as being the key influence on social and economic status. Both of what Marx called "the relations of production" and the application of a particular philosophy are inextricably woven together, and may justifiably be separated only for purposes of analysis. In the next two chapters such separation will occur, and for those purposes. Consideration will be given to the implications of various attitudes towards the control and use of technology.

50. O. Ullrich, "Counter-Movements and The Sciences", in
 Helga Nowotny & Hilary Rose^(eds), Counter-movements in
 the Sciences, D. Reidel Publishing Co., Dordrecht, Holland,
 1979, p. 131

Chapter 6 CONSUMERISM - OR A FRUGAL SOCIETY?

6.1 Economic and industrial alternatives

In Chapter 1 reference was made to that view of the world in which the concept of man's domination over the rest of creation has conditioned people's thinking so that they justify "the ruthless manipulation and exploitation of nature"¹. Such a view has its effect on the economic and industrial organisation of society. If this view is supported, the earth would be regarded as having been supplied to man by divine providence so that he may exploit it to the full, the corollary being that he may turn it into a never-failing cornucopia of consumer goods. This leads, almost inevitably, to the development of a society based on, and dominated by, 'big' technology, a situation considered in Chapter 7. It is based on the delusion that technological cleverness can free us from dependence on the environment.

If, however, the view is taken that our survival (and the survival of vast numbers of other species) depend on our understanding that we are not divinely favoured and set above all other forms of life, that there are no other-worldly privileges or refuges for us, or even other-worldly standards for our behaviour, then we will organise a different system of economic and industrial life. In such an alternative system the idealist notion of 'conquering nature' will be superseded by the non-idealist stance that our continued existence depends on the realisation that we are an

1. J. Rifkin, Entropy, The Viking Press, N.Y., 1980, p. 235

integral part of nature, that we must live, as far as is possible for any energy-users, in harmony with the rest of nature.

The resulting system may be known by various terms, for example, a 'no-growth' society, or a 'frugal' state, or a 'stationary' state, or a 'sustainable' state or a 'low-entropy' society ². The latter terms are considered to be preferable to the term 'no-growth' society used by certain writers on possible economic organisation for the future. The term 'no-growth', while descriptive of the opposition of these authors to the concept of unlimited, or at least unrestrained growth, seems to carry with it a sense of stagnation which does not, in fact, correctly present the notions of the opponents of indefinitely-sustained growth.

6.2 The 'stationary' state

As pointed out by Herman Daly, there are commonly used two meanings of the term 'stationary' state. One is that of "an actual state of affairs towards which the real world is supposed to be evolving"; the other "describes an economy in which tastes and techniques are constant" ³. The preferred meaning is the former one; this implies not a static condition, but rather one of dynamic equilibrium, in which there may be many changes, but all would be within the bounds of available resources - economic, physical and social.

Whatever term is used to describe the societal organisation in question - stationary state, no-growth society, frugal society or sustainable state - it is a fact that the concept is not new. In

2. For a more detailed examination of the use of the term 'low-entropy' society, see Rifkin, *ibid.*

3. H. E. Daly (ed), Towards a Steady-State Economy, W. H. Freeman, San Francisco, 1973, footnote 14, p. 28

the middle of the nineteenth century John Stuart Mill referred to the desirability of a stationary state in words that, as Daly remarked, "could hardly be more relevant today" Daly quotes Mill:

It must always have been seen, more or less distinctly, by political economists, that the increase in wealth is not boundless: that at the end of what they call the progressive state lies the stationary state ... the trampling, crushing, elbowing, and treading on each other's heels which form the existing type of social life ... [are] the disagreeable symptoms of one of the phases of industrial progress ... I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before necessity compels them to it ².

The reappearance of, the advocacy of, and the concomitant criticism of, the concept of the stationary state over recent years carry clear implications for education. Whether or not one agrees with Kenneth Boulding that anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist ³, or whether one advocates a 'less-than-exponential' growth it seems reasonable to suggest that serious thought could be given to the presentation of arguments to the young, for and against the 'stationary state'. The young are subjected to considerable commercial pressure to consider the 'consumer society' to be the most desirable economic environment. In July 1980, during an Australian Broadcasting Commission radio schools broadcast, children were asked whether they would prefer to live in the city or in the country.

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2. J. S. Mill, Principles of Political Economy, Vol II, Parker & Son, London, 1857, pp. 320-326, quoted in H.E. Daly (ed), op. cit. pp. 12-13
 3. K. Boulding, quoted in Moncur Olson and H. Landsberg (eds), The No-Growth Society, Woburn Press, London, 1975, p. 3. In fairness to orthodox economists it must be remarked that they have put forward no claim that there can be an infinity of exponential growth; they completely ignore the whole matter.

The answer of one eight-year-old indicates the depth of penetration of propaganda for the consumer society: "I like living in the city because there are more shops and you can buy more things". It appears desirable at least to present, to the young, alternative views concerning features that go to make up the 'quality of life'.

6.2 Australian Treasury view

In considering the matter of economic growth, the authors of an Australian Treasury paper come to certain conclusions. On the question of the quality of the environment, it is concluded that this can be improved much more - and more quickly - by measures to counter pollution than by steps to contain economic growth. Concerning the depletion of natural resources the statement is made that "resources may be 'used up' but they are also - and as an integral part of the same process - being 'created'" ⁴. How this piece of resource legerdemain may be accomplished without contravening the physical law of the conservation of mass-energy is not explained. The context makes it clear that the authors have in mind material resources (referring, for example, to 'new synthetic materials'). Unless one assumes that the new materials can be created out of nothing by some extraordinary extension of the theory of Plato's Forms (by a projection of the Forms into this world with the aid of some kind of magic), such creation could be performed only by the transformation of energy into mass. While this may be theoretically possible, in terms of Einstein's formula

4. Treasury Economic Paper No. 2, Economic Growth: Is It Worth Having?, Australian Government Publishing Service, Canberra, 1973, p. 39

$E = mc^2$ * , such a transformation has never been usefully achieved on any industrial scale, and is most unlikely ever to be achieved. Note that the authors were not referring to the possible transformation of waste material into useful goods; they were referring to the 'creation' of resources. The production of remarks such as that quoted, by economists, is nothing but fatuous.

The Report's authors put forward the view that if we exploit our mineral resources now, according to current economic and technological conditions, "future generations will not necessarily be less affluent than if we made a concentrated effort to conserve mineral resources for their use ... It will be in the skills and technology of future generations that their fate will lie" ⁵. One is left with a nagging doubt that advances in technological use of resources could be of much benefit if the resources have, in the meantime, been dissipated.

In the same Report a further statement is made which appears to substitute wishful thinking for technical fact or even probability. "There is nothing inevitable", say the authors, "about exhaustion of needed mineral resources arising out of continued growth" ⁶. No evidence is given. Possibly the Treasury economists have in mind a possibility of 100 per cent recycling of materials, even though no mention is made of this matter. Its consideration involves a slight excursion into physics. As Georgescu-Roegen points out, for a perpetual recycling of waste, there must be an additional amount

* E : energy; m : mass; c : speed of light.

5. Treasury Economic Paper No 2., loc. cit., p. 39

6. Ibid., p. 41

of low entropy "much greater than the decrease of the entropy of what is recycled. There is no free recycling just as there is no wasteless industry" ⁷.

6.3 Limits and entropy

The second law of thermodynamics, or the 'entropy law' may be stated as: "the entropy of a closed system continuously increases", or "the amount of order of such a system steadily turns into disorder" ⁸. From the viewpoint of thermodynamics, matter-energy enters the economic process in a state of low entropy and comes out of it in a state of high entropy. Petrol, for instance, is a substance in which the molecules are highly organised. It is therefore a low entropy substance. It may be burned in order to provide energy. The chemical changes involved in combustion produce simpler molecules which are scattered, in disorder. We now have a state of high entropy; the exhaust gases may not be used again in order to supply an internal combustion engine with energy.

We may obtain 'free' energy from two sources. In this context, the term 'free' is used in its thermodynamic sense, i.e. meaning 'available for use', not in the economic sense of being 'costless'. The first source is "the stock of free energy of the mineral deposits ... The second source is a flow, the flow of solar radiation intercepted by the earth". Increased pressure on mineral resources, together with increased pollution, "will necessarily concentrate man's attention on ways to make greater use of solar radiation, the more abundant source of free energy" ⁹.

7. N. Georgescu-Roegen, "Economics and Entropy", The Ecologist, Vol. 2 No 7, July 1972, p. 16

8. Ibid., p. 14

9. Ibid., p. 47

6.4 'Growthmania'

Herman Daly, of Louisiana State University, is a vigorous proponent of steady-state economics. A dramatically-expressed view of his opinion of over-reliance on growth was published in The Ecologist. It warrants an extended quotation:

"Growthmania" is an insufficiently pejorative term for the paradigm or mind-set that always puts growth in first place - an attitude that there is no such thing as enough, that cannot conceive of too much of a good thing. It is the set of unarticulated preconceptions which allows the [US] President's Council of Economic Advisers to say "If it is agreed that economic output is a good thing it follows by definition that there is not enough of it ..."

Growthmania is the attitude which in economic theory begins with the theological assumption of infinite wants, and then with infinite hubris goes on to presume that the original sin of infinite wants has its redemption vouchsafed by the omnipotent savior of technology, and that the first commandment is to produce more and more goods for more and more people, world without end. And that this is not only possible, but desirable.

Environmental degradation is an iatrogenic disease induced by economic physicians who treat the basic malady of unlimited wants by prescribing unlimited economic growth ... one certainly does not cure a treatment-induced disease by increasing the treatment dose! ¹⁰.

Presumably Daly would agree with Weizenbaum's characterisation of the belief that if something is good, then more is better, as "the pig principle" ¹¹.

10. H. E. Daly, "The Stationary-State Economy", The Ecologist, Vol. 2 No. 7, July 1962, pp. 4-5

11. J. Weizenbaum, Computer Power and Human Reason, Freeman, San Francisco, 1976, p. 27

The whole cast of thinking that leads to the consideration of the desirability of developing a 'sustainable' state is that which develops from the non-idealistic belief that man can survive only by recognising that there are no special divine provisions for his welfare, and that man is, materially and in all respects, merely a part of the natural world. It is perhaps fortunate that events are forcing more and more people to undertake this type of thinking. The development of technology over the past two hundred years has occurred in conditions that no longer exist: "virtually unlimited resources and a virtually unlimited assimilative capacity of the biosphere" ¹². A further reason for doubting the ability of advancing technology to maintain the present growth rates without ill effects is given by the fact that there are great areas of ignorance. The long-term effects of many effluents is not known. In fact, as the Minamata tragedy showed, it usually takes a calamity to focus attention on the existence of danger. The chemical industry is producing, at a rapid rate, many substances which have never been known in the 'natural' world, and therefore towards which we have not developed an evolutionary defence. The ultimate biological, including genetic, effects, of which we may be ignorant at the present time, could be devastating.

With reference to the belief that future problems may be overcome by the application of more and more technology, Schwartz holds that "a technological solution is always a quasi-solution because it gives rise to a residue of unsolved problems ... the combined

12. E. J. Mishan, "Ills, Bads and Disamenities" *The Wages of Growth*, in M. Olson and H. H. Landsberg, The No-Growth Society, The Woburn Press, London, 1975, p. 67

problems that exist after the initial solution are greater in number than the original problem ... Problems proliferate faster than solutions can be found" ¹³.

6.5 Problems of the stationary state

Unfortunately many of the proponents of a no-growth or a low-growth society do not appear to have devoted much thought to the solving of the problems that would undoubtedly accompany such a turn in economic and industrial thinking. Mishan, for example, remarks that

the actual means whereby a steady-state economy~~y~~ is to be brought into being - the rationing of raw materials, the constraints on technology etc. - and the level of affluence to be sought are important subjects of discussion. But in the existing state of social awareness, they are perhaps premature ¹⁴.

Avoidance of this topic is, however, the other side of the coin from the facile assumption that technological fixes will always be available to overcome objections to unfettered growth. While it is not here suggested that detailed blueprints should, or could, be drawn up showing all details of such changes, it is nevertheless desirable that the attention of experts should be directed towards the broad problems involved. With no planning it is likely that we will move into a future that we will not like at all. Here, it is suggested, is an area of great responsibility for educators. No curriculum should be considered to be satisfactory, no teacher regarded as completely responsible, unless the matters dealt with in this chapter are raised with the pupils who will have to live with the consequences.

13. E. S. Schwartz, Overskill, Quadrangle Books, Chicago, 1971, p. 63

14. E. J. Mishan, op. cit., p. 81

6.6 Orthodox economics

The urgency of adjusting school curricula so that serious consideration could be given to the problems of unplanned growth, and to possible methods of avoiding these problems, is underlined by an examination of the work of orthodox, and still influential, economists. Some leading economists, after a possible obeisance to the notion that the organisation of society is a matter of vast complexity, then proceed to base almost their entire arguments on some single panacea. An example may be seen in the debate between monetarists and fiscalists:

The issue is not whether money matters - we all grant that - but whether only money matters ... Again, in the fiscal field, the issue is not whether fiscal policy matters ... [but] how much it matters ... Should money be king? Is fiscal policy worth its salt? ¹⁵..

In the face of the network of problems to be solved, and the matter of survival to be considered, one may perhaps be forgiven for feeling that some influential economists are spending their time 're-arranging the deck-chairs on the Titanic'. Yet narrow orthodox economics continues to be taught, and continues to ignore reality. With Galbraith we may perhaps say, "Students arrive; something must be taught; the neo-classical model exists"; and that it lends itself to endless theoretical refinement. With increasing complexity goes an impression of increasing precision and accuracy ... If the economist is sufficiently 'caught up with his data and his techniques', he can overlook social consequences ¹⁶ .

It is, of course, no easy task for a scholar who has devoted his

15. W. W. Heller, "Is Monetary Policy Being Oversold?" in R. T. Gill (ed) Economics: A Text With Included Readings, Goodyear Publishing Co., California, 1973, p. 316

16.. J. K. Galbraith, Economics and the Public Purpose, Penguin, Middlesex, 1975, p. 43

entire professional life to the teaching of orthodox economics to admit that his teaching may now be useless, or even inimical to man's well-being. He may continue, as Galbraith further remarks, "his attention being elsewhere", and "without damage to conscience" to "support a system that can maltreat large numbers of people" ¹⁷.

6.7 H. C. Coombs's view of necessary change

In an ecologically ordered world, says H.C. Coombs, "the life it would offer would be strangely different from our own and man himself would become a radically different creature" ¹⁸. While Mishan had remarked that a consideration of the means whereby such a society could be brought into being may be premature, Coombs is of the opinion that the skills required may not be those of an economist at all, the economist's view of man being too restricted. The skills of the psychologist, the sociologist and the anthropologist may be more relevant. He notes that if resources important to human survival "are being used recklessly, if goods are being produced in ways which produce harmful side-effects", then price rises in these goods or processes would be seen as logical to an economist; this could cause a fall in the living standards of persons who ordinarily used the goods concerned. On the other hand, desirable technological changes could be stimulated. Furthermore, it may be, with a different general understanding of the desirability of an ecologically sound society certain goods "now regarded as symbols of affluence and status may become socially proscribed and the pattern of life may be so

17. Loc. cit.

18. H. C. Coombs, "Matching Ecological and Economic Realities", Australian Conservation Foundation Occasional Publication No. 9, Melbourne, June 1972, p. 18. Dr. H. C. Coombs is an Australian economist who was adviser to Prime Ministers Menzies, Curtin and Chifley, and sometime Governor of the Australian Reserve Bank.

altered as to call for new types of economic effort and enterprise"¹⁹. Thus a reduction in the standard of living would occur only if man's picture of his wants remained unchanged. With the decline in the production of ecologically unacceptable goods, human and other resources would be available for other goods, and particularly services. Instead of seeking a plethora of (often gimcracky) consumer goods, we may find it possible to "live in gracious cities and towns well endowed with parks and gardens, with schools and universities ... playing fields, museums, art galleries and theatres, with ready access to an unspoilt natural environment"²⁰.

The reaction of many, however, to the ecologists' arguments may be that this is the plea of a privileged class, members of which want to preserve the good things which they already enjoy. Furthermore, alterations in the patterns of industry, the redistribution of resources, the elimination of the obsolescent, are all easier in a growth economy. "But need an ecologically acceptable economy", asks Coombs, "be without growth?" Given the key factor of a stable population, growth could derive from a more effective use of known resources and "from the development of new goods and services employing little or no scarce materials"²¹. He concludes that, economically speaking, "there are no necessarily catastrophic revolutions involved in this"²².

6.8 Educational effects

The effects of growing up in such a society would be profound: the deep-ranging influences on personal, community, and educational

19. Ibid., p. 7

20. Ibid., pp. 10-11

21. Ibid., p. 14

22. Loc. cit.

attitudes would be those set out by Bundy in considering the nature of a relevant education:

1. Great stress is placed on people loyalties, i.e. the belief that people are happier when they can care for and rely on each other rather than on huge institutions.
2. Education means helping people to discover their own individuality and what is unique to the person rather than mass conformism and engineered satisfactions.
3. A high value is placed on saving, conserving and sharing attitudes.
4. There is a desire to personally make and do things, not to have the ready-made thrust upon one at every turn. Someone educated for the post-industrial world, therefore, would prefer to use simpler, low-energy tools to perform personal services and services for others. Young people would have more of a sense of craft, enjoy a simpler way of life, and be more tolerant of other life-styles. They would believe intensely in social justice and the right of other cultures to shape their own futures.
5. Education would mean development of a deep understanding of our confluence with the natural world, how we are part of, and interconnected with the endless variety and harmony of nature. (Emphasis added).
6. These attitudes and skills would in turn imply long-term spiritual, social and environmental perspectives in making personal and social decisions ...²³.

It is obvious that the term 'spiritual' used here by Bundy has nothing in common with the use that would be made of the term by a philosophical idealist, or a supernaturalist; this is made clear by the underlined section above. It may also be noted that Bundy's use of the term 'post-industrial' carries a meaning different from that

23. R. F. Bundy, "Social Visions and Educational Futures", Phi Delta Kappan, Vol. 58, 1976/77, p. 88

of such writers as Daniel Bell²⁴. Bell's 'post-industrial society' could be characterised as a 'super-industrial society', a society such as that implied as desirable in the Australian 'Myers Report', in which no consideration appears to be given to the development of anything but 'big' technology, and no consideration appears to be given to the question of the control, or even of the purpose of technology²⁵.

6. 9 The Chilean experiment

The only published material which does, in fact, consider the control of technology by, and in the interests of, the ordinary people rather than by, and in the interests of, multinational corporations, appears to be in the writings of an English cyberneticist, Stafford Beer, reporting on happenings in Chile during the period November 1971 to September 1973. The overthrow of the Allende government near the end of 1973 cut short what was a most significant experiment in the application of modern information technology to the productive and economic affairs of a nation. Apart from Beers's own report²⁶, the work has been almost unpublicised; the only other public acknowledgement of the experiment that has come under notice occurs in a note in a recently-published book by Ian Reinecke²⁷.

Had the Chilean experiment continued, we might have been able to

24 D. Bell, The Coming of the Post-Industrial Society, Penguin, Middlesex, 1976

25. R. Myers (chairman), Report of the Committee of Inquiry into Technological Change in Australia, Australian Government Publishing Service, Canberra, 1980

26. Stafford Beer, Platform for Change, John Wiley & Sons, London, 1975

27. I. Reinecke, Micro Invaders, Penguin, Ringwood, Victoria, 1982, p. 234

examine how, in practice, modern technology, in particular cybernation, may be used by, and for the benefit of, the mass of the populace. In our industrial society, advancing technology is seen by many young people as a threat to the humaneness of society, and to the 'human-ness' of industry, a means whereby they will become unemployed outsiders, alienated from society. Had the Chilean experiment not been aborted by a combination of wealthy corporations and a hostile United States government²⁸, there would have grown up, in Chile, a generation of young people who would have understood, by means of their daily experience, including their educational experience, that technology, automation, cybernetics, are not necessarily inimical to the aspirations for full personal development of ordinary people. The implications for education itself would have been extensive. It is possible to visualise an education system based on the study of 'friendly' technology; a flowering of scientific studies; a commitment to cooperative work instead of ruthless competition; a full development of the cultural potential of a people who were described by Beer as "highly literate", the men being "frank and friendly", the women "gorgeous and gay", and all possessing "as great a spirit of freedom as ... anywhere in the world"²⁹.

6.10 The 'cybercultural' revolution

Industrial society has produced tools which extend the perceptiveness of man's senses, the skill of his hands, and the strength of

28. See, for example, J. Petras and M. Morley, The United States in Chile, Monthly Review Press, N.Y., 1975; E. Boorstein, Allende's Chile, International Publishers, N.Y., 1975; I. Roxborough, P. O'Brien and J. Roddick, Chile, the State and Revolution, Macmillan, London, 1977

29. S. Beer, op. cit., p. 424

his muscles. The fundamental change brought about by what Alice Mary Hilton calls the 'cybercultural revolution' lies in the invention of devices that supplement, or are substitutes for, the work of man's brain³⁰. The lesson is that 'unemployment' must be changed to 'constructive leisure'. There needs to be a rapid re-examination of our morality and our ethics. While basic morality - the sanctity of human life, the dignity of the individual - remain, yet the ethos of a society is transient, and must be altered to fit the needs of society. Constricted by the bonds of the so-called 'Protestant ethic' (which is a good deal older than Protestantism, being found in the Old Testament, Genesis 3, 19: "In the sweat of thy face shalt thou eat bread ...") this is an ethic which brings no joy to the millions who can find no way of earning their bread or of putting the sweat of paid labour on their faces.

A complete process of mind-changing will be necessary for the mature and influential, a process of re-education in the organisation of a cybercultural society for the benefit of the citizens of that society; and for the young an education that will equip them to live creatively in a society that treats them with courtesy. At present the growing problem for the young is that

there seems to be no place for them in the world. They know society looks with dread upon the vast numbers that are pouring out of schools, and they know that it is wrong for them to be met with fear and loathing. They are the future of mankind, and they have a right to be welcomed with joy³¹.

30. A. M. Hilton, "An Ethos for the Age of Cyberculture", in Z. W. Pylyshyn (ed), Perspectives for the Computer Revolution, Prentice-Hall, Eaglewood Cliffs, N.J., 1970. See pp. 480-495

31. Ibid., p. 490

The question remains: how far can formal school education lead to societal change? Schooling cannot, of itself, have any rapid, or indeed significant impact on economic and productive methods in general use while the outside community whole-heartedly accepts these methods. However if technological changes cause such social ferment that there is generated a spreading public awareness of the necessity for shifts in the nature of society's organisations, the schools may then play a significant role. When change is 'in the air', when community thinking is shaking loose the ties binding it to ways of life that are proving no longer satisfactory, then the education system may, by tuning the minds of the young to nascent possibilities, help to prepare them for the changes initially triggered by technological developments. It would, especially in such periods, be desirable that all teachers should be closely in tune with events, sensitive to changing social aspirations, and flexible enough to adapt their curricula and teaching to accord with emerging community needs and demands.

7.1 'Big' technology

It may, of course, be the case that the adoption of a 'sustainable state' will be rejected, and that our community may be persuaded that a desirable future may best be obtained by the development of what could be called 'big' technology, under the control of large corporations. Again there could be seen the influence of aspects of philosophical idealism. At first sight it may appear that philosophical idealism has little or no bearing on the development and application of 'big' technology. Further consideration reveals, however, that the control of such technology is closely linked to some aspects of idealism. In particular, idealism is relevant to the possible, or even probable, societal constraints imposed by the application of 'big' technology. and especially that of the so-called 'plutonium economy', and that of the computerisation of society. Such constraints inevitably lead to a consideration of the effects on education.

Idealism maintains that the Absolute, or the Idea, contains the universe, which operates eternally and perfectly ¹. If reality is permanent, then values, derived from the authority of such eternal Ideas, are themselves permanent. The authority of the ideal may be assumed, at least in part, by individuals or groups who become arbiters of values. This is not to say that such groups must work consciously/~~with~~ the aim of setting themselves up as authoritarian

1. I am indebted here to formulations made in B. O. Watkins and R. Meador, Technology and Human Values, Ann Arbor Science Publishers Inc., Michigan, 1978

arbiters; such a position may be assumed as a result of their possession of expertise and knowledge which confer power, and which are not shared by the mass of the populace. "The authoritarian promulgation of values, derived from the philosophical tradition of idealism, probably constitutes the chief means by which values are established today" ². Modern technology is becoming extremely complex, to such an extent that a trained, specialist elite is required to operate it. "As a result, ordinary men and women are deprived of the ability they previously had to control their own environment ... technical knowledge does not develop naturally out of local technologies but forms a distinct body of knowledge" ³.

In a society dominated by 'big' technology and by the corporations that would control such technology, it is almost certain that the civil rights and individual liberties of the ordinary citizen would be eroded. Education would then be affected, with an intensification of the historically-persistent trend towards a double standard: a superior (and in this case highly technical) education for an elite, and an inferior education for the masses. It is, however, also likely that the education of all pupils would be such as to inculcate values consistent with the domination of big technology and big corporations. Bundy sets out characteristics of the education of young people in such a society. He includes:

1. development of strong loyalties to large institutions
2. the acceptance of living within and being processed by these large institutions

2. *Ibid.*, p. 137

3. R. Clarke, "Technical Dilemmas and Social Responses", in N. Cross et al (eds), Man-Made Futures, Hutchinson Educational and Open University Press, London, 1974, p. 37

3. an acceptance of super-affluence in industrial terms and the inevitable waste and disparity that accompanies such affluence
4. development of the desire for the ready-made product or service over what one can personally make or do
5. development of the belief that nature is a relentless enemy that must be constantly at bay
6. formation of utilitarian decision-making skills based on situational ethics and short-term efficiency to satisfy immediate needs ... ⁴.

In such a technologically-based society, an over-riding aim of an education system would be to indoctrinate citizens with a belief that wisdom consists of deferring to experts and officials; that the single aim of society would be to keep the productive processes working efficiently. The basis of indoctrination would be, in the words of Roszak, to convince the populace of three interlocking premises:

1. That the vital needs of man are (contrary to everything the great souls of history have told us) purely technical in character ... If a problem does not have a technical solution, it must not be a real problem ...
2. ... wherever social friction appears in the technocracy, it must be due to what is called a "breakdown in communication"...
3. That the experts who have fathomed our hearts' desires and who alone can continue providing for our needs, the experts who really know what they're talking about, all happen to be on the official payroll of the state and/or corporate structure ... ⁵.

When any system controls the culture, including the education

4. R. Bundy, op. cit., p. 98

5. T. Roszak, "Technocracy's Children", in Liberation and Control, Deakin University, Melbourne, 1979, pp. 91-92

system, we have totalitarianism. Education, as noted above, would become dichotomised: a technical training for those destined to become 'experts'; and possibly an education for the majority which would have the nature of the 'reforms' introduced into Italian education in 1923 by the idealist philosopher who became Mussolini's Minister for Education, Giovanni Gentile. Such a system which was, interestingly enough, labelled as 'radical' and 'progressive' (except by Mussolini, who called it "the most fascist of all the fascist reforms") was based largely on the development of spiritual values, on the development of personality, and on loyalty to those in authority. Little attention was paid to the development of the critical faculty, or of an understanding of the lessons of history. Such an education could be aimed at the production of a general population lacking the intellectual means to be subversive towards the aims of those in control of society ⁶.

7.2 The nuclear industry and plutonium

It is visualised that one of the probable features of such a society would be that electrical energy would be based largely on the nuclear industry, and that in particular power stations would include those which use 'breeder reactors'. The breeder reactor uses plutonium as fuel; fuel assemblies consist of plutonium and the natural uranium isotope U-238. Some neutrons produced by the fission processes in plutonium would be absorbed by U-238 atoms; this produces plutonium which, on being removed, would serve as new fuel for the breeder.

There is potential danger in the operation of such reactors.

6. See H. Entwistle, Antonio Gramsci. Conservative Schooling for Radical Politics, Routledge & Kegan Paul, London, 1979, pp. 78-86

The experimental Breeder-I, an experimental reactor in the eastern Idaho desert, suffered a partial melting of its fuel in November 1955 and never operated again ... the Fermi reactor, sited near Detroit, Michigan, experienced a fuel melting accident ... Luckily, the Fermi accident did not release any radioactivity to the general population, but its aftermath was so serious that one engineer at the plant was prompted to remark, "We almost lost Detroit" ⁷.

Other, and frequent mishaps in standard uranium-type reactors as well as breeders, have led to widespread apprehension concerning the safety of the industry. A Reactor Safety Study, released in 1975 by the US Nuclear Regulatory Commission, gave the impression that it was possible to predict the nature of accidents in nuclear plants. The wildest imaginings of the Commission could not, however, have predicted that a technician, using a lighted candle to find leaks, could have started a fire at the Brown's Ferry nuclear plant in 1975 that burned for seven hours and shut down the world's two largest reactors for eighteen months ⁸.

The malfunction that brought the USA closest to tragedy in the 1970s was that at the Three Mile Island nuclear plant. The plant had come "within 30 or 60 minutes of a meltdown" ⁹. Experts in nuclear energy had stated many times before the accident that there could be no chance of any melting in the nuclear core; yet the Kemeny investigatory committee found "general agreement that some fuel was liquefied" ¹⁰.

With the passage of time, and assuming that big technology

7. R. Nader and J. Abbotts, The Menace of Atomic Energy, Outback Press, Victoria, July 1977, p. 188 (first published in the United States by W. W. Norton & Co., Inc.)

8. Ibid., pp. 60-61

9. The Nuclear Regulatory Commission, reported in the Sydney Morning Herald, 26 January 1980

10. Ibid., 1 November 1979

widens and deepens its domination, together with the consequent extension of the use of nuclear energy for electricity generation, the use of breeder reactors, and the aging of operating uranium fission reactors, more accidents and malfunctions are likely to occur. A result could be a desire on the part of members of the public to mount protests. Such public protests have, of course, been seen in a number of countries. It is reasonable to assume that if society were almost entirely dominated by proponents of big technology, such demonstrations would be met by extremely repressive measures. As early as 1977, in a country professing to maintain the forms of democracy, poison gas was reported to have been used against demonstrators. This was in West Germany; not only was CN gas (chloroacetophenone) used, but also another gas was used which it was admitted later could have had fatal consequences ¹¹. Ultimately such protests could be completely overwhelmed by governmental force. There is strong suspicion that even murder has been resorted to in the case of one dissident in the USA: Karen Silkwood, a worker and union representative in a US nuclear plant ¹².

There is an even more cogent reason for suggesting that there could be a loss of civil liberties than of silencing dissenters and protestors on matters of the general safety of the nuclear industry. With the use of 'breeder' plants, the possibility could grow that plutonium may be diverted into the possession of terrorist groups.

11. R. Jungk, The Nuclear State, (Trans. E. Mosbacher), John Calder, London, 1979, pp. 129-130

12. See R. Nader and J. Abbotts, op. cit., p. 170

The possession of even a small amount (about 10 kilograms) of plutonium by a fanatical group, possibly backed by a maverick government, could result in the making of a nuclear weapon which could be used either to threaten the destruction of a large centre of population, or even to carry out the threat. The probability is growing that "acceptance of nuclear technology amounts to the virtual certainty that some nuclear bombs will end up in the hands of terrorists" ¹³.

Such activities could produce official action paralleling that of a totalitarian police state. Normal processes of law would undoubtedly be ignored. It is extremely likely that all normal liberties of the citizens would be abrogated 'in order to protect the citizens'.

7.3 Unemployment

In the type of society being visualised, one of the key features would almost certainly, be widespread and permanent unemployment. This circumstance would follow the general adoption of the products of the microprocessor industry: cybernetic control of industrial processes, involving 'smart' robots; the 'automated office'; automated warehousing; computerised supermarket check-points; the 'cashless society'; electronic mail, and other aspects of electronically-controlled automation. All the necessary technology is now available.

Even as far back as 1967 cybernetic systems were making an impact on employment in manufacturing industries. A. M. Hilton gives

13. R. C. Clark, Technological Terrorism, The Devin Adair Co., Old Greenwich, Conn., 1980, p. 57

an example of 'Detroit automation' in Ford's engine manufacturing plant. Human labour required to tend 300 machines was reduced to three workers; a couple of years later this system was already obsolete, and the three human monitors were replaced by a computer ¹⁴. Persons displaced from manufacturing industries will not be able to find jobs, even after re-training, in the office force. The use of word processors reduces drastically the employment of typists. File clerks (and the factory workers who make filing cabinets) will be dispensed with as it becomes possible to file all information electronically. With the provision of suitably-placed satellites, word processors may be linked, both within a country and internationally. Secretaries, mail clerks, postmen, letter sorters, persons engaged in the transport of mail, will find that their jobs either vanish or are greatly reduced. It is, of course possible that girls and women, denied the opportunity of engaging in their 'traditional' jobs, may break out of the mental strait-jacket that has so often caused them to limit their ambition to the so-called 'female occupations'. They may begin to demand an education that will fit them for the more technically-oriented jobs. We may then, no doubt, expect a spate of propaganda aimed at persuading women that their place is with the Nazis' 'three Ks': Kinder, Kirche, Küche, being good housebound wives and mothers, with no ambition to compete vigorously for the so-called 'men's jobs'.

There are two aspects of authoritarianism in the sweeping into

14. A. M. Hilton, "Cybernation and its Impact on American Society", in P. Witt (ed), Technology and the Curriculum, Teachers' College Press, Columbia, 1967, pp. 7 and 9

all aspects of society of the 'micro-chip'. One has been referred to: the fact that power resides with those who have the expertise and the knowledge to understand and make use of the new technology. The other is that a primary aim of the use of microprocessors is that of control, including the control of people. The only exception appears to have occurred very briefly in the aborted national experiment in Chile; this has been mentioned in the previous chapter. The introduction and use of microprocessor technology are decided by powerful groups and individuals; workers "are not generally consulted in the design of the introduction of computer technology. Their opinions are certainly not sought on the basic question of whether its introduction is necessary" ¹⁵.

Despite the enthusiasm of the 'gee-whiz' school of writers on computer-based technology, and despite the equally unqualified endorsement of the 'Myers Committee', the use of such technology in our profit-based society is unlikely to be an unmixed blessing to the ordinary citizen. The Myers Committee put forward the view that it believed that "the available historical evidence shows that technological change has in the long term created wealth and employment, and that future technological changes will continue to have this effect" ¹⁶. In this matter, Barry Jones M.H.R. (now - March 1983) Minister for Technology in the Australian Government, noted that in the 1,300 pages of the Report, only 1½ pages deal with the central

15. I. Reinecke, op. cit., p. 17

16. R. Myers (chairman) op. cit., para 4.57

historical argument concerning the effects of technology. "What evidence is thereⁱ, he asked, "to suggest that the present era is one of continuity rather than discontinuity with past economic history? If so, where is it examined in the Report?". He further noted that the Report

is superficial and wrong in its reading of economic history and gives the impression that since the Industrial Revolution full employment has been the norm ... Since the Industrial Revolution began in Britain in 1780, unstable employment has been the norm - over 200 years there have been 30 years of full employment ¹⁷.

As Hilton points out, the monumental fallacies set out in the statements of such report-compilers are due to their faulty understanding; they confuse automation with mechanisation. The most sophisticated mechanical system is an 'open system' in which the control loop is closed by a human being. On the other hand an automatic machine is a 'closed system' in which the human controller has been replaced by a computing machine. If this simple point were grasped by people who issue unduly optimistic Reports, they would understand that any methods used in the past to insulate society against periodic unemployment are no longer relevant ¹⁸. The main reason for installing machines controlled by microelectronics is, in our society, to dispense with human labour.

17. B. Jones M.H.R., "Technology as a Cargo Cult: on the Deficiencies of the Myers Report", in National Outlook, Vol. 2 No. 11, November 1980, pp. 16-68. See also Barry Jones's statement to Federal Parliament, Hansard, 18 September 1980.

18. A. M. Hilton, op. cit., p. 482

7.4 Control of people

The matter of control has been mentioned. It is obvious that increasing use of the micro chip will enable governments and other agencies to gather, store, and easily refer to, much more personal information about people than they have even been able to do before. Speer, one of the Nazi leaders, after spending twenty years of contemplation in Spandau Prison, stated that

Hitler's dictatorship was the first dictatorship of an industrial state in this age of modern technology, a dictatorship which employed to perfection the instruments of technology to dominate its own people ... The instruments of technology made it possible to maintain a close watch over all citizens ¹⁹.

The development of microelectronic technology would enable a future dictator - one of Plato's 'herdsmen' and his 'watchdogs', as they are described by Popper - to keep a minute record of every action of the 'cattle' - the ordinary citizens.

7.6 Computers in schools

To many people the micro chip and the computer carry an air of magic, of mysticism. In view of the ubiquitous nature of the intrusion of this technology into the lives of every citizen, an important duty of an education system is to remove such mysticism. The time is fast approaching - in fact the time is probably on us now - when ignorance of at least the general operation, and the powers and capabilities of the micro chip and its offshoots, such as the computer, will be as damaging as ordinary illiteracy. Such ignorance may well be termed 'technological illiteracy'. It therefore becomes

19. Quoted in L. Yablonsky, Robopaths, Penguin, Middlesex, 1973 reprint, p. 55

essential for not only an elite, but also for the ordinary citizen, in self-defence, to become familiar with computers. The place to start is obviously with the children who will grow up in a world dominated, technologically, by electronics. Fortunately this task is being tackled, sporadically and somewhat ineffectually in some States of Australia, but efficiently in one or two. One would expect that, in time, the example of the one or two States will spread to the others.

One of the States in which the challenge of the computer is being met effectively is Tasmania. In this State, upon the decision being made that computer illiteracy should be overcome in the operations of the school system, a sensibly-planned schedule of activities was started. The first step was to take out of the schools a small band of experienced teachers who were also experts in the field of computer work - they had completed tertiary courses in this work. An operational centre was then funded and set up: the Elizabeth Computer Centre, in Hobart. From the initial planning work of the people working in the Centre, computers were installed in all government high schools and technical schools, linked to large computers in the Centre, by means of a linking system called 'Tasnet'. Later, further large computers were linked into the system, and based in more northerly cities. Well-organised and funded programmes of inservice training, together with regular teacher-conferences, were organised to ensure competence on the part of the teaching service.

In post-primary work, two main courses are available: for senior students a Higher School Certificate course on computer science; and for junior students a shorter and less rigorous course on computer awareness. These are straightforward courses, no doubt

designed, at least in large part, for vocational purposes. Perhaps the more interesting and significant work, however, is that being carried out in the primary schools, and in schools for the handicapped.

Primary schools are encouraged, and aided, to procure microprocessors; Spreyton Primary School, for instance, having introduced its first microcomputer in 1979 was, in 1982 planning confidently to have a microcomputer in every classroom. There is no thought that microcomputers or any application of these machines will replace teachers. The aim is to have the students using the technology as a naturally-adopted aid to learning, and as an extension of their ordinary school work. The key point, and an absolutely vital point in the success of the work lies in the fact that programmes are planned, constructed and thoroughly tested by the full-time workers at the Elizabeth Computer Centre, for supply to the schools. It would be quite futile for any school authority to try to set up a school microcomputer system without the existence of such a full-time centre. The development of a satisfactory programme for use in a primary class takes months of full-time work at the Computer Centre. No classroom teacher would have the time (or energy) available to develop a useful range of programmes.

I was fortunate, in September 1981, to be able to spend time at the Centre observing operations, and to visit schools in which the programmes were in use. At Landsdowne Crescent Primary School, in West Hobart, I spent a day with two pupils who were using a microcomputer. The two things that impressed me most were (a) the non-trivial nature of the programmes, and (b) the absorption of the pupils in the work. Two pupils, a boy and a girl, spent several hours showing me the use of the various programmes. These, while

ostensibly in the form of games and puzzles, were in fact quite solid exercises in mathematics, involving not just drill work, but quite searching exercises in the use of multiplication, division, addition, subtraction and the use of negative numbers. The manipulation of symbols on the screen required a combination of concrete and abstract understanding. At one stage the two children discovered a 'floppy disc' containing a programme for a 'pinball' game; they had not previously encountered it in the store-box. They inserted the programme, and for a few minutes conducted a fairly mindless pinball game. At the end of this short time they spontaneously decided that "This is boring", rejected the programme, and went back to the mathematics programmes. It is obvious that these children will grow up into a world of computers in which the machines will hold no esoteric status. Perhaps such early, and continuous training will help to produce citizens who may know how to protect themselves from some of the worst abuses of the new technological age.

Chapter 8 A RELEVANT CURRICULUM

8.1 Students and relevance

The time has come to set out the qualities of a school curriculum and of a school organisation which may best serve the interests of the coming generation; this task is taken in the light of the analyses made in the preceding chapters. Let us first take note of a judgment of a pupil concerning the current, and traditional, school education. "I studied Physics and Chemistry at a selective high school for six years. I thought then, and I still think, that what I studied had no relevance to my life"¹. This is the opinion of an intelligent and successful tertiary student, who has been able to cope with irrelevance and to pursue further studies that did have relevance for her. In how many students, one wonders, has a perceived irrelevance of school studies led to terminal boredom and a consequent lack of desire for further study?

If one looks for a topic which has the greatest relevance to any person's life, it is surely the matter of the continuation of that life. One sure way of gaining attention quickly and incisively, and of establishing immediate relevance, is by means of a responsibly-given warning of imminent danger to well-being, and even to life itself, together with a presentation of suggested methods of avoiding

1. Statement made by an M.A. candidate, Wollongong University, November 1982.

the peril and even improving well-being.

As far as contemporary society is concerned, the relevant point seems to be that a group of serious and learned men are warning of eco-catastrophe - and in my view the case is very strong for listening to them attentively. Let me put it like this: If a number of apparently highly-qualified or intelligent experts inform you that they have reason to believe there is a time-bomb in your sitting-room ... only an idiot would not take some sort of vigorous action ².

It is strongly urged that a curriculum which would be seen by students to be relevant to their lives would be one which is based integrally on environmental studies. Such a curriculum is suggested not only because, if properly constructed and applied, it would gain the active interest of students, but also because there is, at present, no other realm of study which has so much urgency in the task of preserving the human race. The implications of information set out in Chapter 1 may be sufficient to justify the latter statement; if not, there is an overwhelming case set out in an increasing amount of published material on the environmental hazards confronting mankind, of which the matter of Chapter 1 was merely a small sample.

In order to cope with the problems which will confront them as mature citizens, students should not only gain expertise and experience in problem-solving during their school years, but also, in and through the organisation of schools themselves, they should develop confidence and responsibility in decision-making. Consequently a plea is put forward in this chapter for two desirable aspects of school life: (1) the development of solidly-grounded, problem-based

2. S. Boyden, "Environmental Change: Perspectives and Responsibilities", in J. Evans and S. Boyden (eds), Education and the Environmental Crisis, Australian Academy of Science, Canberra, 1970, pp. 14-15

environmental studies; and (2) an organisation of school life based on democratic decision-making. In order to produce citizens who could not only understand the techno-demographic problems facing mankind, but who could also organise and take steps in doing something positive towards the solutions of those problems, both aspects of school life are needed. In what follows, consideration will be given first to the question of environmental education itself, and, later to the lessons which may be learned from the application of democracy-in-action, as demonstrated in a specified Australian school.

The usual attitude in Western society, that most attention should be given to an increase in specialised scientific research, in technological innovation, and in steadily-increasing and never-ending economic development, is a cultural phenomenon. The linkage of such beliefs with an underlying (even if unconscious) acceptance of aspects of philosophical idealism has been sufficiently dealt with in previous chapters, so that no further reference to this matter will be made in this chapter.

8.2 Anachronistic textbooks

The cultural phenomenon referred to in the previous paragraph is "fostered deliberately and continually during the education of children at the primary and secondary level"³. An examination of textbooks used in lessons, particularly in science and social studies in Australian schools will bear out this assertion. To take just one example, chemistry textbooks usually deal admirably with the facts and theories of chemistry. Although the despoliation of the

3. Ibid., p. 17

environment by man's activities has long been known to chemists, yet there has been very little reflection of concern in school textbooks. In other words, practically all current chemistry textbooks are socially anachronistic.

Most school text-books are model illustrations of a non-critical stance. In the natural sciences, for example, the background and limitations of scientific discoveries are very seldom described. Texts concentrate on presenting on what we think we know, but ignore altogether what we should know ⁴.

From the point of view of relevance to the pupils' contemporary lives and future prospects, it is at least as important to know the impact of the chemical industries - as regards both their products and their wastes - on the quality of man's life, as it is to have a grasp of reaction dynamics and the structure of the periodic table of the elements. The former type of study may not, of course, have much importance in the matter of passing the kind of examinations currently set for students. A further reference to this matter will be made later in the chapter.

Certainly it may be maintained that such wiser knowledge would be of immediate relevance to people such as the unfortunate inhabitants of the Love Canal area (referred to in Chapter 1), to people in Sydney living near chemical liquid waste dumps, to people living on the banks of polluted rivers, and to those spending their lives breathing the smog that passes for air in our large cities. And it would be difficult to doubt that a responsibly-conceived study of the increasing threat to the natural environment, linked integrally

4. J. Botkin, L. Elmandjra, M. Malitza, No Limits to Learning. Bridging the Human Gap. A Report to the Club of Rome, Pergamon Press, Oxford, 1979, p. 35

with a study of chemistry itself, would be seen by students to have relevance to their lives and to the lives of the children they may hope to raise in the future.

This should not be taken as indicating in any way a lessening of rigour in the treatment of the subject-matter of chemistry itself. A non-trivial study of environmental matters would rest very firmly on a thorough knowledge of traditional subject-matter, not only in the example taken, that is, chemistry, but of all subjects within the scope of school courses. It is generally accepted that we learn most thoroughly what we practice. An extension of the subject-matter, for example, of chemistry, to include environmental studies would undoubtedly increase both the learning-readiness and the depth of understanding, on the part of the students. It is visualised that any effective course of study encompassing reference to the environment would involve a great deal of personal activity on the part of the students. They would learn, not only by studying, but also by doing. In the case of chemistry, the studies would not be confined, as is usually the case at present, to the four walls of a classroom and to 'set' experiments (whose outcomes are already known, at least to the teachers) in a laboratory. Their studies would be taken out into the 'real' world, and would inevitably become more meaningful than are the typically examination-directed studies of traditional courses in secondary schools.

In relation to the anachronistic nature of most textbooks, I have recently had an exciting experience, in looking through what appears to be one of the first of a new type of textbook. This is of a kind which, it is hoped, will be increasingly produced in the near future. This book, Environmental Chemistry, has been edited and partly written by J. O'M. Bockris, of Flinders University, South

Australia⁵. Some of the technical material in the book may go a little beyond school chemistry, but much of it could be studied by any reasonably intelligent school chemistry student in the senior classes of a high school. It is to be hoped that the lead set by this book will be followed by school textbook writers, in providing for students and teachers a series of books integrating environmental matters with the traditional topics of school courses, not only in such subjects as physics, chemistry, biology and geology, but also in economics, geography and history. The integration of environmental matters into the three last-named studies is important because the solutions to our problems do not depend on the natural sciences alone, but also, and significantly, on the social sciences and the humanities⁶.

With reference to the Bockris book not only is it based on a consideration of chemistry itself, but the chemistry is applied to a number of the environmental problems facing the world. Included among its 23 chapters are such topics as: 'Biochemical Control of Human Fertility'; 'The Psychochemistry of Pollutants' (the effects of pollutants on the brain, and subsequent changes in behaviour); 'The Chemistry of Sewage Purification'; 'The Chemistry of Water Pollution'; 'Radioactivity'; 'The Desalination of Water'; 'Analytical Chemistry of Pollutants'; a chapter noting fields of work in which research is needed; and a chapter concentrating on matters of public policy involved in dealing with environmental degradation - a societal aspect which finds no place in traditional chemistry

5. J. O'M. Bockris (ed) Environmental Chemistry, Plenum Press, N.Y., 2nd. printing (first published 1977)

6. S. Boyden, op. cit., p. 18

textbooks. Such an approach opens up an entirely new view of chemistry for students, and one which would not only gain their immediate interest as school pupils, but would also provide them with the knowledge necessary for them to act as informed and socially-responsible adults - and voters - in the future.

One may readily visualise the heightened interest in the chemistry of lead, for instance, among senior students at Port Kembla High School if they were actively and personally engaged in the study of atmospheric lead pollution and its effects on the mental and bodily health of children in the area; this is a matter worrying many people in the Port Kembla area of New South Wales. Not only would interest in such topics as analytical chemistry as related to lead and its compounds be increased, but also the students would gain a first-hand knowledge of the activities (and possible shortcomings) of such agencies as the State Pollution Control Commission and the State Health Commission. As well, they could gain an informed familiarity with the technical and economic operations of the local industries responsible for the pollution.

8.3 Eagerness in learning

The eagerness of students to work and learn when study-material is seen to be relevant to their lives, and a dramatic change from the often-seen passive and low level of co-operation in classroom work, were demonstrated clearly in an environmental activity undertaken a few years ago in England⁷. The work, organised by the Advisory Centre for Education at Cambridge and the Sunday Times newspaper,

7. Information on this matter is taken from E. M. Nicholson, "Key-note Address", in D. Hughes-Evans (ed), Environmental Education: Key Issues of the Future, Pergamon Press, Oxford, 1977, pp. 10-11

actively engaged some 8,000 school children, most being aged between 10 and 13 years, with some older, and "a substantial number" younger. The newspaper published an article on water pollution, together with advice that a study 'kit' could be obtained on the payment of 75p.

The 8,000 children engaged themselves in the project enthusiastically, conducting non-trivial work independently, without the help of teachers or other officials. A booklet containing some 7,000 words of explanatory material accompanied the kit, and was read "avidly" and understood even by the children younger than 10 years. The participants were urged to forward their results by a closing date, two months on, to the Cambridge Advisory Centre. The children's data were analysed by counties and in some cases compared with data obtained by the river authorities. "There were no major discrepancies between the results obtained by the children and detailed maps prepared by the experts" (Emphasis added) ⁸. In some cases the children identified serious local sources of pollution; this indicates how they could be encouraged to play a significant part in monitoring the environment.

It is perhaps a pity that all of our politicians and influential public servants have not had the benefit of an education such as that being suggested in this chapter, so that these adults could have become at least as environmentally literate as the 8,000 English school children. As E. M. Nicholson put it, at a Conference held at the College of Technology, Farnborough, England,

I never cease to wonder at the depths of environmental illiteracy

8. Ibid., p. 11

complacently revealed by so many highly intelligent public servants, academics, politicians, businessmen and apostles of culture. To me not being environmentally educated is simply not being educated ... When one sees so much daily incompetence in decision-making of our leading economists, administrators, politicians and businessmen, the kind of education they have had can only be rated as totally inadequate and unacceptable to equip them for the higher functions they presume to carry out in our complex and delicate society ⁹.

8.4 Problems associated with environmental studies

The problems associated with the incorporation of environmental studies into school curricula are not trivial, particularly in secondary schools. One obstacle is the usual organisation of the secondary school timetable, broken into 'periods' of 40 minutes, each of which is controlled by a traditional subject-specialist. Longer blocks of time would be required for field studies. Furthermore, teachers presently found in the schools were trained in one, possibly two, subject-specialities, and would understandably be reluctant to venture into fields of teaching in which there is as yet very little resource material such as suitable textbooks available, and in which the demands on the teacher would be greater than is the case with traditional studies. The emphasis would be on individual and small-group studies, with an accompanying change of role for the teacher from the whole-class didactic role which is at present most common, to the role of the teacher as planner and organiser of studies. Courses in teacher-education in universities and Colleges of Advanced Education would need to be changed, so that experience could be gained in the acquiring of the necessary lesson material for

9. E. M. Nicholson, "Keynote Address", in D. Hughes-Evans (ed). op. cit., pp. 5-6

environmental studies, and in the methods of organising efficiently individual and small-group work in classes in which there would inevitably be encountered a wide range of ability and application.

The question of examinations would need close study. At present in New South Wales, as in other states of Australia, work in upper years of secondary schools is almost entirely dominated by the requirements of the Higher School Certificate examinations, or their equivalent. Examiners as well as teachers belong to a conservative profession. It has been remarked by the Schools Council (England) that it is unfortunate that a subject has to be examined before it is "respectable"¹⁰. This situation holds in Australia also, at least as far as secondary studies are concerned. The Schools Council notes that there is difficulty in reconciling the large amount of field work necessary for effective environmental education both with the normal lesson periods and with the traditional methods of examination. Environmental studies deal with complex real situations which are dynamic, not the frozen knowledge embodied in textbooks. Questions based on information recalled at examination time do not seem suitable; considerable difficulty would be experienced in testing by means of the often-posed 'objective-type' questions, the chief merit of which is that their marking may be done mechanically and therefore relatively inexpensively.

The examinations required would be based on ethical achievements as well as factual information; the students would "not only have

10. Schools Council, Project Environment. Education for the Environment, Longman, London, 1974 (a Schools Council research and development project in environmental education for pupils between the ages of 8 and 18).

discovered the relevant information but [would] have sifted that information, decided on their own attitudes and be in a position to defend their values" ¹¹. Consequently it would be necessary to provide questions which do not ask for mere recall, or the solutions to closed-ended problems, the answers to which are already known to the examiners. The students should present a marshalling of evidence, the presentation of a case, and a statement of personal conclusions, including values.

This could clearly demonstrate a pupil's intellectual ability through his competence in reading environmental situations and the predictive value of such an assessment is as high as, if not higher than, that of recall questions ...

Finally, as there is no virtue in an ability merely to recall numerical and other simple facts, we would like to see candidates having their field notes available for the written part of the examination when they are stating values and presenting their evidence ¹².

Clearly the adoption of environmental studies as an integral part of school work in the secondary school would involve a great deal of adjustment in examination procedures.

8.5 Survey of environmental studies in Australia

It was noted by Fensham, in making a report on the 1975 'Belgrade Conference' on environmental education, that at the time national surveys of environmental education in schools had taken place in only two countries: West Germany and Australia ¹³. The Australian

11. Ibid., p. 51

12. Ibid., pp. 51-52

13. P. Fensham, A Report on the Belgrade Conference on Environmental Education, Curriculum Development Centre, Canberra, 1976

survey has been written by Russell D. Linke¹⁴. Linke/stated that at the international level "the UN Conference on the Human Environment in 1972 probably marked the most significant achievement for many years"¹⁵. One of the decisions made at this Conference was that international meetings should take place on the subject of environmental education; the Belgrade Conference was the first of these¹⁶. Before considering the Australian situation, Linke noted the status of environmental education in some other countries. In Quebec environmental education in primary schools "revealed a generally superficial, uncoordinated and non-integrative treatment"¹⁷. In New York a few topics such as land use or water pollution have been discussed, but "at a relatively superficial level with no particular disciplinary perspective"¹⁸. In Britain there had been so far "no specific legislation on environmental education"¹⁹. The situation in Australia is little different.

In general, according to Linke, primary science curriculum guides in the various states of Australia give little indication of environmental emphasis, the main topic covered being some references to wildlife conservation. A survey of teachers' perceptions of environmental education showed that they were "at best imprecisely stated, and at worst completely confused"²⁰. While there have been some references made to questions of the environment in some of the established disciplines in secondary courses, yet such

14. R. D. Linke, Environmental Education in Australia, George Allen & Unwin, Sydney, 1980

15. See Appendix I of this thesis for a statement of conclusions reached by participants in this Conference.

16. See Appendix II of this thesis for a statement of the 'Belgrade Charter', a statement issued at the conclusion of the Conference.

17. R. D. Linke, op. cit., p. 41

18. Ibid., p. 48

19. Ibid., p. 83

20. Ibid., p. 83

references have at best been only fragmentary. Thus the "development of environmental education in Australia has to date been marked more by indifference than enthusiasm" ²¹.

As far as books and other source materials are concerned, a survey showed that the mention of environmental matters is haphazard and sketchy. On various named junior science textbooks examined by Linke, in one "there was no obvious conservationist theme"; in another only one unit had any reference to an environmental matter - this consisted of the statement: "man depends on the soil for his food ... and should ... maintain this vital natural resource". In another, the title of which promised a strong environmental emphasis, "the analysis revealed very little". In a fourth "there was no explicit consideration" of environmental issues; and in a fifth the only references that could in any way be linked with environmental education were "one or two isolated references to such things as utilisation of energy from a water mill, and production of energy from respiration and foods" ²².

Books widely used in senior science courses were also surveyed. Physics textbooks contained scarcely any reference to human/environmental interaction; the same situation was seen in Chemistry textbooks. In Biology, one very widely-used textbook contained, in Part 1, a number of environmental references, but in Part 2 only a few of the chapters contained explicit references to interaction between man and his environment, "and only in isolated instances". Another

21. Ibid., p. 177

22. Ibid., p. 188

Biology textbook gave few references to man and the environment, and even in these it was found that relevant examples were scarce, including such warnings as "a cautionary reference to collecting birds' eggs" ²³.

In textbooks dealing with Social Science/Social Studies, the emphasis on human/environmental interaction was low, with references only to "such things as caring for children, buying food", or to such things as "relocation of farming communities, soil and crop improvement, and the development of urban parks". In Geography, on the whole, the "level of environmental emphasis ... was quite low", except for one book, in which there was displayed "a positive and explicit conservationist stance" although "the emotive impact was ... relatively weak" ²⁴. It is obvious from the above information that the question of providing environmental education for Australian school students has not yet received any serious attention, by either school or education authorities, or by the writers of textbooks. Yet it has been held that "people have a democratic right to be educated about ecological principles and environmental issues" ²⁵.

8.6 Constructing syllabuses and curricula

In Australia there has been a long tradition of centrally-conceived and prescribed syllabuses. It was only a few years ago that various state education authorities decided to allow schools a significant amount of autonomy in setting their own courses of study. Only very general guide-lines were sent out from Head Office. This move was

23. Loc. cit.

24. Ibid., p. 202

25. D. K. Withrington, "The UNESCO/UNEP Environment Programme and its Implications for British Environmental Education, in D. Hughes-Evans (ed), op. cit., p. 41

not universally welcomed by teachers for several reasons. Despite the proclamation by central office educational authorities of the desirability of the move, provisions were not made for the teachers to have extra non-teaching time in order to carry out the time-consuming tasks associated with devising syllabuses. Furthermore, many considered that they had not been trained in, nor had sufficient experience in, syllabus construction. Despite the overall proposition put forward that increase in autonomy is, per se, a good thing, many teachers have expressed the opinion that, given the restrictions on time and money available for work on home-grown syllabuses, they would be quite happy to accept centrally-constructed syllabuses - with certain provisos. These were that the syllabuses had been set up by syllabus and curriculum experts in collaboration with practising teachers; and that they had been tested thoroughly in a number of schools before being generally recommended. Some experienced teachers have expressed the opinion that the apparently rigid prescription implied by centrally-supplied syllabuses did not, according to their past experience, restrict their autonomy appreciably. They believed that each experienced teacher would handle each topic in his own idiosyncratic way; that there would not be rigid conformity of teaching. They preferred to 'hone' their own lessons, improve the presentation, and seek out interesting examples and experiences, rather than spend their time in making up syllabuses ab ovo. Furthermore, the view has been put forward that it is fairer to both pupils and parents if children moving from one school to another encountered much the same basic material in lessons in each school.

If it were to be decided that the case for environmental studies is strong enough to warrant their introduction into Australian schools, it is suggested that the most satisfactory method for introducing such studies would involve a return to the methods of centralised syllabus construction, with the provisos noted above. While the comments on the previous page, relating to the attitudes of teachers on the matter were not based on any rigorously-conducted survey of the teacher population, or the distribution of questionnaires, they were based on discussions held with many practising teachers over a period of some thirteen years in and around the classroom. It would, in fact, be too much to expect any teacher, trained by current methods, to be a master of all the types of knowledge that would be required to construct a series of syllabuses integrating environmental studies with the traditional studies, for pupils exhibiting the range of abilities that are commonly found in schools. Particularly in secondary schools, "the majority of staff ... were educated in traditional subject disciplines, and many before environmental problems were recognised as such" ²⁶.

8.7 Extra subject, or integration?

Implications of previous remarks would be that it is desirable for environmental studies to be integrated, or inter-woven with the subjects presently taught, rather than adding another subject to an already crowded curriculum. In any case the separation of environmental studies as an extra subject would bring the strong possibility that, as not all subjects are studied by all students

26. S. McB. Carson, "Environmental Science in the Formal Education Service", in D. Hughes-Evans (ed), op. cit., p. 26

in high schools, a number of students would not experience the benefit of the work.

According to a Discussion Paper prepared for the Australian Department of Home Affairs and Environment, there is "agreement that environmental education should begin in the earliest years of schooling and should permeate the curriculum"²⁷. This clearly implies that environmental studies should not be planned as a separate subject, but that consideration of environmental matters should be integral to the subject matter studied in all disciplines - as indeed environmental matters are properly integral to all activities of man outside the classroom. Such an aim would involve, not piecemeal and ad hoc additions of paragraphs or sections to already existing syllabuses, but a fundamental revision of the entire range of syllabuses, both primary and secondary. This would be a major project, requiring not only broad vision but also a consideration of the detail of each teaching-subject. This is a main reason for the suggestion that the planning of such changes should be a centralised task, in which the services of curriculum specialists, practising teachers, and subject and environmental specialists could be called on. It is a project whose scope is far too great for individual teachers or staffs of schools to handle. It is, in fact, a project requiring a far more intensive and critical examination of teaching material than any that has, it would appear, been undertaken in any previous education reorganisation.

27. Department of Home Affairs and Environment, National Conservation Strategy for Australia: Towards a National Conservation Strategy: A Discussion Paper, Australian Government Publishing Service, Canberra, 1982, p. 56

It certainly needs a far more intensive and extensive consideration of integration of environmental studies into all other subject matter than that suggested by the Council of Europe Committee of Ministers in 1971. This sets out as Content and Objectives on the introduction of basic principles of nature conservation into education, the following programme:

1. Nursery schools

Respect for all forms of life

Care for animals (food, drink, shelter, nesting boxes, etc.) and plants

2. Primary Schools

A. Study of the environment

i. awakening a general interest in nature;

ii. study of the environment: introduction

a. to the interdependence of living creatures through study of natural communities (forest, ponds, copse, mountain, beach, etc.) and also artificial communities (park, field, towns, etc.)

b. to the influence of man on nature and vice-versa;

c. to the vital natural resources: water, air, soil, flora and fauna.

B. Civic education (ethics and religion)

i. respect for the life of other living creatures;

ii. the duties of young people, and particularly their behaviour towards conservation work.

3. Secondary schools

A. Biology

i. Basic principles of ecology:

interdependence of living creatures and the physical environment, vegetable and animal communities, notion of the biosphere, trophic chains, energy flows.

ii. study of pollution and the damage it does:

air pollution; sprays, smokes, CO, SO₂, H₂S, O₃, NO, NO₂ etc.,

fresh water, phenols, detergents,
sea water, oil,
soil pollution.

D. Physics

- i. the water cycle (see biology, geography and chemistry);
- ii. air pollution; oil (see chemistry);
- iii. fresh water pollution; phenols and detergents (see chemistry);
- iv. sea pollution: oil (see chemistry);
- v. effect of radiation: radio-activity and radioactive wastes.

E. History

- i. the main steps of man's history and his increasing mastery of nature - from the prehistoric tool to modern technical methods;
- ii. disorders and wars: following disturbances to the balance between man and his environment, mass human migrations;
- iii. the decline of civilisations caused by wrong use of natural resources, examples.

F. Economics (if there is no economics course, the following items might be included in the geography curriculum)

- i. wise and unwise use of natural resources;
- ii. world famine: origins: evolution of the situation, remedies, new sources of protein, etc.;
- iii. economic consequences of destruction of natural balance, for example through the introduction of unsuitable species²⁸.

Absolutely no exception could be taken to any of the items included in this proposed programme. Yet it seems unsatisfying for two reasons. Firstly, it omits at least one most important matter;

28. Council of Europe. Committee of Ministers. Appendix to Resolution (71) 14, adopted in Strasbourg, 27 July 1971, quoted as Appendix C in Schools Council, Project Environment, op. cit.

and secondly, as presented, it seems anaemic. Either the world is facing a crisis not paralleled in history, in which man is facing the alternatives of survival or destruction, or it is not. If it is not, then complacency may reign with no evil effects. If, however, as is maintained by an increasing number of world authorities, we are facing such a crisis, then it is time for a dramatic change in our approach to education, and the existence of the crisis should be emphasised. On the question of omissions, one example will be given. In the physics section of the programme there is not one mention of the world's problems with energy. Nor is this mentioned in the section on economics. Yet, as noted by Odum and Odum, everything is "based on energy. Energy is the source and control of all things, all value, and all the actions of human beings and nature. This simple truth, long known to scientists and engineers, has generally been omitted from most education in this century" ²⁹. Their book discusses "how energy controls our lives, our economy, our international relationships, our standard of living, and our culture" and points out how, "to understand this story, one must have an understanding of humanity as part of nature" ³⁰. A course that does not link energy with both physics and economics (as well as any study of the social sciences) is quite unsatisfactory for the modern world. Unfortunately, as the Odums remark, "economists have not been educated in energetics, and therefore have not understood the second law of energy and the fact that energy is not reused" ³¹.

29. H. T. Odum and E. C. Odum, Energy Basis for Man and Nature, McGraw Hill, N.Y., 1976, p. 1

30. Ibid., p. 2

31. Ibid., p. 226

This point has already been noted, in Chapter 6 of this thesis (see 6.2 'Australian Treasury view').

With respect to the impression of anaemia, or bloodlessness, gained from a reading of the Council of Europe programme, it could appear that what is envisaged is in the nature of what the Schools Council (England) calls "education about the environment" ³². The objectives of such a study are chiefly cognitive ones, in that the aim is to amass information. In this way the study could present little that is different from much of the material currently presented in schools, and which may be useful for passing examinations, but which would make little difference to the pupils' attitude to the world or to their understanding of the urgency for action. Alternatively it could be regarded as "education from the environment", in which "teachers have sought to forward the general education of the child by using the environment as a resource" ³³. What is needed is "education for the environment", in which there is an emphasis on

developing an informed concern for the environment. The objectives go beyond the acquisition of skills and knowledge and require the development of involvement to the extent that values are formed which affect behaviour ... the objectives of education for the environment are clear and positive goals of an ethical nature ... a responsibility for the environment ³⁴.

In other words, what is required is what the most recent Report to the Club of Rome calls "innovative learning", instead of "maintenance

32. Schools Council, op. cit., p. 31

33. Loc. cit.

34. Loc. cit.

learning" ³⁵. Innovative learning is "a necessary means of preparing individuals and societies to act in concert in new situations", whereas maintenance learning is "the acquisition of fixed outlooks, methods and rules for dealing with known and recurring problems" ³⁶. Note the inclusion in the definition of innovative learning of the phrase "to act in concert". The whole drive of a recasting of the curriculum, based on an appreciation of the urgency of confronting environmental matters, needs to be based on answering the questions: "How may we act on these matters?" , "How may the community, in concert, act?" and "How may people be persuaded to co-operate in the interests of humanity?"

8.7 DEMOCRACY IN ACTION IN A SCHOOL

The view of man as a co-operative animal implicit in the previous sentence needs consideration; it has already been referred to briefly in Chapter 2 (see 2.8 "Co-operation and competition"). In Chapter 4 (see 4.4 "Education and democracy") reference was made to A. Pearl's suggested methods for organising the various age-levels in schools so that there would be a gradual, but definite, and planned progression in the pupils' abilities to consider matters of school organisation, and to take responsibility for significant aspects of the organisation. It was there remarked that these notes "set out what might be regarded as a theoretical prescription for education in democratic practice". It remains to be seen whether or not such prescription may be applied successfully in Australian conditions.

35. J. W. Botkin, M. Elmandjra, M. Malitza, op. cit., pp. 12 and 10

36. Loc. cit.

An examination of a book by K. S. Cunningham and Dorothy J. Ross indicates that the answer to the question is: "Yes, it can; and it has been applied successfully". The book sets out an account of work done by Ms. Ross while she was headmistress of Melbourne Church of England Girls' Grammar School ³⁷. It may be, of course, that similar successful schemes have been applied in other schools; if so, it is unfortunate that their success has not been published for the benefit of a wider audience than that which may be gained by word-of-mouth reputation.

It will be noted that the school over which Ms. Ross presided was a private, that is, non-government school. This has some significance, in that it is usually possible to preserve a continuity of staff more easily in a private school than in the public system in which teachers are relatively frequently transferred from school to school to meet the exigencies of central office planning, or to allow of staff promotions. It may, therefore, be more difficult in a public, or government school to maintain a particular method of organising student government than in a private school. The successful inauguration of a system such as democratic student government requires not only a far-sighted and determined leader, but it also requires, in the initial stages at least, a great deal of discussion and even proselytising amongst staff, parents and other significant adults.

8.8 School atmosphere: the importance of the Principal

It is possibly not realised widely how the 'atmosphere' of a

37. K. S. Cunningham and Dorothy J. Ross, An Australian School at Work, Australian Council for Educational Research, Hawthorn, Victoria, 1967

public school influences the frequency of the transferring of staff out of the school. I have worked in schools in which transfers were rare - either out of the school or therefore into it. In such cases the favourable atmosphere, largely created by the Principal, had been such that teachers were happy to remain on the staff for a considerable number of years, even to the extent of passing up possible promotion. The teachers felt that the personal fulfilment experienced by working productively and co-operatively in an encouraging and pleasant atmosphere was rewarding enough to allow them to ignore promotion. On the other hand I have seen how, in just such a school, a change of Principal from one year to the next has been followed by a spate of applications for transfer. It has been said that a school is the elongated shadow of its Principal. There is enough truth in that statement for it to be taken seriously.

A frequent path for promotion of a teacher to Principal is that of careful and conscientious work over a considerable period of years and a careful application of the principle of not 'blotting one's copy-book', or not 'causing waves', of following the small print of regulations meticulously. Such a person may be an effective administrator, if by administration is meant the application of regulations to the letter, and a detailed and prompt attention to the minutiae of the clerical work involved in the school's office work. Such a person may also be completely bereft of the most important attribute of an administrator, that is the ability to 'get on with', to inspire, and to work cheerfully with other people; in particular the ability to work with subordinates without believing that the fact that he is in a higher status position in the hierarchy automatically confers superiority on him. With

some pompous, arrogant Principals, it is possible, even likely, that a democratic system such as that applied at the school being cited as an admirable example, may never work. It may, however, be hoped that if the scheme were applied in a sufficient number of schools, then the upwardly-mobile, ambitious members of school staffs who set their sights on a Principaiship may have any unfavourable proclivities so altered by their earlier years of working within such a system that, by the time they reached their goal they would be big enough for the job of handling a democratic system.

A person who is big enough for the job of Principal is one who is confident enough to be able to rejoice in the development of others, particularly subordinates, without feeling that such development threatens his own status. His task is not necessarily easy. It requires that he

be democratic himself. It is very easy to be a good organizer with absolute control, where staff and pupils can be moved around as units in a pattern in the head of the organizer. On the other hand it is very difficult to be a good organizer in democratic conditions, where staff and pupils have the opportunity of sharing in the planning and where all are self-propelled persons³⁸.

8.9 Melbourne Church of England Girls' Grammar School (M.C.E.G.G.S.)

There appears to be no published account of what has happened at the school since the retirement of Ms. Ross. However, for sixteen years between 1939 and 1955 certain most desirable principles were inaugurated, developed, and codified, under the guidance of Ms. Ross. The fact that the school was a private school had a certain significance, but not such an overwhelming significance that the principles

38. Ibid., p. 27

applied at the school could not be applied in schools in the government system. In the first place, the fact that it was a private school did not mean that it was academically selective. It was, in fact, a comprehensive school, catering for a wide range of abilities. There was, of course, the option not available easily in a government school of expelling disruptive pupils; this does not, however, seem to have been called upon. There is a paucity of published research work on the matter of the application of thorough-going democracy in school systems, for an obvious reason, that is, the extreme rarity of examples which may be studied. It does not seem too much to expect, even in the absence of such research work, that if methods similar to those advocated by A. Pearl, and applied by Dorothy Ross were applied generally in school, from infants' classes up, much of the current trouble and disruption caused by some pupils would dwindle.

Nor was M.C.E.G.G.S. a small school, such as some of the private 'alternative schools' in which there is an informal, uncoded democracy practised; such schools typically contain twenty or thirty pupils. M.C.E.G.G.S. was a school of some nine hundred pupils, divided into five stages: sub-primary, primary, junior secondary, middle school, and senior school. The organisation of such a school is no simple task, particularly as variations in learning rates in specified subjects were catered for by arranging an individual timetable for each girl, so that "in a class of thirty there might be only two pupils with completely identical timetables" ³⁹. It is not a present purpose to explore in detail the class and lesson

39. Ibid., p. 40

organisation needed for such an arrangement; this is set out in the book under consideration. In the present notes, notice will be taken only of the school as a democratic community.

8.10 Democracy in a school

It is recognised that, a school population being largely juvenile, its government cannot be completely democratic. In a community consisting of young children, adolescents, and adults, hierarchical organisation with prestige depending partly on age differences is difficult to avoid. In such a situation a system involving the maximum possible democracy must be deliberately planned so that there is a progressive development of responsible participation in decision-making. It would not be sufficient to leave such development to the force of pious hopes or a generalised goodwill. The mechanisms, the means-whereby, and the techniques of ensuring such development must be carefully worked out and adjusted as experience shows the need for adjustment.

One of the tasks of a comprehensive school is to contribute to the personal and social maturity of its pupils, who are individuals with different talents, potentialities and interests.

In the comprehensive school each pupil should have full opportunity to develop those individual potentialities and widen those interests in the fellowship of others with different gifts. It is through this very fellowship that a pupil's awareness of his potentialities and his desire to contribute to the group emerges. To be accepted, one must contribute to the group. Through acceptance, paradoxically, one learns what one has to contribute. Only by working with and alongside others at a common task does one come to know oneself⁴⁰.

Consequently opportunities should be provided for each pupil to have

40. Ibid., p. 84

both rights and responsibilities. At M.C.E.G.G.S. such opportunities were based on four techniques. First was the organisation of free and open discussion. This involved discussions at all levels and in all situations. Teachers had to be prepared to give reasons for all orders and requests; in relation to the pupils' views, the teachers needed to be "tolerant of questions and able to maintain reasoned discussions with them"⁴¹. This rested, of course, on the existence of maturity and psychological security on the part of the staff. In earlier years such discussions would be 'directed', the amount of direction decreasing as the pupils grew older and more mature. From such discussions there was readily evolved a functioning of the class as a form committee fitting into the pattern of self-government in the school and operating with a degree of formality.

Next there was required a free access to information, through announcements at regular meetings of form, and on notice-boards. Such dissemination of information was basically the responsibility of the Principal, but it was also a province of the staff; it was also "an important training for pupils to prepare notices, bulletins and occasional papers, to make announcements in assembly, and to keep public notice-boards up to date"⁴². Then, within some limits dictated by the nature of the population, arrangements should exist for a freely-elected government. Even though some activities, such as basic financial expenditure, need to be reserved, yet experience at M.C.E.G.G.S. showed that the pupils may plan, organise and carry

41. Ibid., p. 86

42. Ibid., pp. 88-89

out many school activities. With experience commencing at an early age, and expanding as they reached senior forms, they were "capable of managing, not only form affairs but also of undertaking the planning of school activities on a much wider scale" ⁴³. For the pupils' experience to be effective and truly educative, it was necessary that the work of the pupils, for example in the form committees, to be seen as real, and to be taken seriously by the form teacher and the rest of the school.

Finally, the school needed an agreed-upon legal system. "A school, with profit to its members, can practise the techniques of self-government and law-making with enough freedom of discussion and access to information to make the practice real and meaningful, not artificial and insincere" ⁴⁴. Of course there must be a seamless web of democratic activity across the entire community. This involves true participation by the staff in policy-making. Staff meetings need to be real meetings, not occasions for the announcement of decisions already decided on by the Principal.

8.11 The machinery of democracy

So that there would be time available for necessary pupil discussion, the M.C.G.G.S. made provision for what was called a 'vertical' period each week (so called because of the positioning of these on the same time-table spot for each form in the school). On a specified day each week, one period was set aside for the simultaneous occurrence of form meetings and meetings of what came to be known as the Students' Executive Council. It was timetabled straight after

43. Ibid., p. 89

44. Ibid., p. 90

lunch, so that the Students' Executive Council meetings could begin during lunch-time, and continue in the 'vertical' period.

It has been pointed out by Ms. Ross that the full organisation of such activities did not spring into being instantaneously. It took six years to reach a stage where anything resembling self-government emerged, and at the end of sixteen years the techniques were still evolving. Some of the major steps taken between 1939 and 1945 were:

- (a) Prefects were elected by their fellow students instead of being appointed. The head still appointed the captain of the school. [Note that the prefect system was later discarded] .
- (b) Occasionally meetings took place of teachers and prefects as a group, with the head in the chair, to discuss matters of common interest and concern.
- (c) A committee of prefects, staff and senior form representatives met regularly, with the captain of the school in the chair. This advisory committee discussed matters of common interest but had no executive powers.
- (d) The elected body of prefects elected its own chairman who became captain of the school.
- (e) As senior forms were represented on the advisory committee, each form constituted itself as a form committee to elect these representatives. Gradually form business was extended to other matters.
- (f) This form-committee activity extended to lower forms to give training in committee techniques.
- (g) Various committees evolved to run extra-curricular activities. Staff and pupils worked together on these. The number of such committees gradually increased.
- (h) For four years the ten or twelve prefects functioned as an executive committee with restricted powers mainly related to general school discipline. It worked alongside the advisory committee described in (c).
- (i) A sub-committee of the advisory committee, consisting of the head, two members of staff and four girls, was elected to

consider the possibility and the implications of forming executive body with wide representation of staff and girls. After many meetings a provisional constitution was drawn up and its adoption brought into being the first executive council. This consisted of five staff members and twenty-five girls. Thereafter prefects as previously understood no longer existed. All members of the council were known as councillors. * 45.

Form meetings were conducted in a formally-correct manner, with a secretary to keep minutes which were handed on from one year to the next; and other office-bearers who gave regular reports on the carrying out of their duties. The business of the form committees was of two kinds: (a) domestic matters concerning only the form; and (b) consideration of bulletins from and recommendations to the school Executive Council. It will be noted that in the Constitution of the Students' Executive Council areas were clearly set out in which the Council was self-governing, and those on which the head could exercise the right of veto. This was to prevent the development of frustration and possible cynicism where a body of pupils may spend a considerable amount of time discussing a matter, only to be told at the end that they had no powers to resolve the matter.

The Council's constitution formally set out the membership, matters concerning elections, meeting-times, office-bearers, powers and duties and other matters relevant to the effective functioning of the Council. The meetings, which were in practice held at least once a

* The Constitution of the Executive Council after ten years of operation is given in Appendix III.

45. Ibid., pp. 94-95

fortnight for about an hour, gave pupils experience in expressing their views on the running of the school, and enabled them to learn "techniques for conducting meetings, to acquire tolerance in reasoned discussion, to learn the unsuspected difficulties often involved in making changes, to respect and value minority opinion - in fact, to acquire the art of carrying out an official job in a responsible and creative way" ⁴⁶.

The suggestion is made strongly that a combination of a curriculum integrally based on environmental studies and relevant to the most urgent tasks facing mankind should be combined with a democratic method of organising school activities. It is confidently predicted that such a combination of activities would produce adults who could contribute usefully to the solution of some of the world's most pressing problems. Perhaps these suggestions may form a practical method of advancing towards the "world of more adventurous education" asked for by Bertrand Russell.

46. Ibid., pp. 100-101

Chapter 9 CONCLUSION

Even if one is not disposed to accept the most fearsome of the 'doomsday' predictions of futurologists, it is necessary at least to recognise a few simple facts about humanity and the earth we inhabit. In the first place the earth is a sphere - or, more precisely, as we were taught at school, an oblate spheroid. But whether sphere or spheroid, its surface is finite. Therefore the materials occurring at or near the surface, in zones accessible to man, are of finite extent. The digging up and using of these previously unused materials must, at some time, come to an end. With many of these, this time is not likely to be unduly delayed.

Schemes that are more and more ingenious may be devised for the recycling of inorganic materials. But for such recycling there is a price; the price-tag is written in terms of energy. A rich lode of mineral may be exploited and its products used in manufacture. None of the atoms of its constituent elements is lost (except in the so-far infinitesimal amounts lost to outer space in a few space-probes). But their use by man causes them to be spread out, to lose their concentrated form. In order to re-assemble them in useful concentrations, energy must be used. As Georgescu-Roegen remarked, "There is no free recycling". Technically unsophisticated optimists, such as the Australian Treasury Department economists quoted earlier, have pinned their hopes for a future of continued and uninterrupted and increasing production of consumer goods on a hope that future break-throughs in technology may solve all problems. But no technological advances in material-handling appear to

be at all likely ever to contravene the laws of thermodynamics. These have been expressed in completely non-technical terms as: "First law: Anything you gain on the swings you lose on the roundabouts; second law: But whatever you do you can't break even".

In considering available sources of energy it is obvious that in time we must come to the end of usable supplies of fossil fuels - coal, petroleum, natural gas, oil-shale. Deposits of these are finite, and long before the last gram of any of these is used up, the position will be reached in which the extraction of the fuel material would require the use of more energy than would be available from the material itself. Some writers pin hopes on the perfection of the Promethean reactions, that is, the duplication on earth of atomic fusion reactions that power the sun. With a vast supply of raw material, the hydrogen of the oceans' waters, such writers have predicted that successful fusion reactors will supply an "almost unlimited" amount of energy. Apart from the enormous technical difficulties which, even with the most optimistic forecast, will prevent success of this venture being gained in time to alleviate shortages of fossil fuels, it is again a vain hope that man could use "unlimited energy". It is impossible to do just one thing; "the effects of what you do in the world will always spread out like ripples in a pond, and will make faraway and long-delayed changes you have never thought about"¹.

The continued use of large amounts of energy of any kind (on 'the swings') must produce equivalent quantities of heat ('the roundabout'). Resulting heat pollution can ultimately disturb the

1. Friends of the Earth, The Stockholm Conference, Only One Earth, Earth Island Ltd., London, 1972, p. 20

nice balance of factors influencing the world's climate, with, quite certainly, effects to which we are unaccustomed, and which would bring about conditions which would be most unfortunate. If man goes on producing consumer goods at the present rate, or at an increased rate, without thought of the heat produced, the future must be grim. Furthermore, the production of such goods, without sufficient care for the unwanted side-effects, may condemn man to die, or at least to live in some misery, in his own wastes.

It has been a contention of this thesis that at least a significant contributing factor in the development of the present condition of man has been his adherence (often unconscious) to the beliefs inherent in, or flowing from, philosophical idealism which, according to arguments already presented, have led him to the erroneous and dangerous belief that he is above nature, that there are special ameliorating dispensations for humanity. It appears that the way to avoid the disaster facing any living thing that tries to use more energy or matter than the sun and the earth can sustainably provide is to abandon such idealist thinking and realise that we either live on nature's terms or we die.

What is needed is more than ad hoc, patch-up attempts at minimising the effects of individual problems as they occur. What is needed is what Blackstone calls a "transvaluation of values in regard to attitudes toward nature and the environment"². Even though the answer to our problems does not lie in a return to primitive conditions, or of stopping all technological developments, what is needed

2. W. T. Blackstone, "Ethics and Ecology", in W. T. Blackstone (ed), Philosophy and Environmental Crisis, University of Georgia Press, Athens (USA), 1974, p. 42

is a realisation that

many things have value and use which have no economic value and use. Consequently we must broaden our evaluational perspective to include the entire range of values which are essential not only to the welfare of man but also to the welfare of other living things and to the environment which sustains all of life ³.

Most adults are slow to change their life-beliefs and habits. It may be that the only hope for the future lies with the children, with helping them to grow up with an understanding that man is just one of the living creatures on earth, a part of nature, not superior to it. There may still be time; it is with this hope in mind that the suggestions put forward in this thesis have been made: that the curriculum of schools should be entirely re-written so that the content of all subjects is infused with and merged integrally with a study of the urgent precautions and positive measures needed for man to survive. And that the organisation of schools should be such that the citizens emerging from the schools should not only understand the problems and the necessary solutions, but also should be capable of taking dynamic action in the community in order to ensure the application of correct principles. As foreshadowed in remarks in the Introduction, it is necessary to alter not only idealist methods of thinking about our relationship with the earth, but also to introduce changes in both curriculum and in school organisation. All these factors are inter-related; none of them would be, by itself, effective. This is the basic reason for the ineffectiveness of reforms instituted from time to time by Departments of Education; such reforms affect only the nature of the curriculum.

3. Ibid., p. 40

APPENDIX I

CONCLUSIONS OF THE STOCKHOLM CONFERENCE

The Proposed Principles of the Declaration on the Human Environment; United Nations Conference on the Human Environment, Stockholm 9 - 18 June 1972 (as quoted in Friends of the Earth, The Stockholm Conference. Only One Earth, Earth Island Ltd., London, 1972. Note particularly paragraph 16).

1. Man has the fundamental right to adequate conditions of life, in an environment of a quality which permits a life of dignity and well-being, and bears a solemn responsibility to protect and enhance the environment for future generations.
2. The natural resources of the earth, including the air, water, land, flora and fauna, and especially natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.
3. The capacity of the earth to produce vital renewable resources must be maintained, and, wherever practicable, restored or improved.
4. The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion.
5. The discharge of toxic substances, or of other substances in such quantities as to exceed the capacity of the environment to render them harmless, must be checked to ensure that serious or irreversible damage is not inflicted upon ecosystems.
6. Economic and social development is essential for ensuring a favourable living and working environment for man and for creating conditions on earth that are necessary for the quality of life.
7. Environmental deficiencies generated by the conditions of under-development pose grave problems and can best be remedied by and in the course of development.
8. The environmental policies of all States should enhance and not adversely affect the present or future development potential of developing countries or hamper the attainment of better living conditions for all and appropriate steps should be taken by States and international organizations with a view to

reaching agreement on meeting the possible national and international economic consequences resulting from the application of environmental measures.

9. Resources should be made available to preserve and enhance the environment, taking into account the particular requirements of developing countries and any costs which may emanate from their incorporating environmental safeguards into their development planning and the need for making available to them, upon their request, additional international technical and financial assistance for this purpose.
10. Relevant environmental considerations should be integrated with economic and social planning to ensure that development plans are compatible with the need to protect and enhance the environment.
11. Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and enhance the environment.
12. Planning must be applied to human settlements and urbanization with a view to avoiding adverse effects on the environment and obtaining maximum social, economic and environmental benefits.
13. Demographic policies, which are without prejudice to basic human rights and which are deemed appropriate by Governments concerned, should be applied in those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects on the environment or development, or where low population density may prevent enhancement of the human environment and impede development.
14. Appropriate national institutions must be entrusted with the task of planning, managing or controlling the environmental resources of States with the view to enhancing environmental quality.
15. Science and technology must be applied to the identification, avoidance and control of environmental risks and the solution of environmental problems, in the furtherance of economic and social development.

16. Education in environmental matters, especially for the younger generations, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and enhancing the environment.
17. Research and free exchange and transfer of scientific and other knowledge and experience must be promoted to the fullest extent practicable in order to facilitate the solving of environmental problems taking particularly into account the needs of developing countries.
18. States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.
19. States shall cooperate to develop further the international law regarding liability and compensation in respect of damage which is caused by activities within their jurisdiction or control to the environment of areas beyond their jurisdiction.
20. Relevant information must be supplied by States on activities or developments within their jurisdiction or under their control whenever they believe, or have reason to believe, that such information is needed to avoid the risk of significant adverse effects on the environment in areas beyond their national jurisdiction.
21. Man and his environment must be spared the serious effects of further testing or use in hostilities of weapons, particularly those of mass destruction.
22. Cooperation through international agreements or otherwise is essential to prevent, eliminate or reduce and effectively control adverse environmental results resulting from activities conducted in all spheres in such a way that due account is taken of the interests of all States.
23. States shall ensure that international organizations play a coordinated, efficient and dynamic role for the protection and enhancement of the environment.

Appendix II

(Quoted from Connect. UNESCO-UNEP Environmental Education Newsletter, Vol. 1 No. 1, January 1976, pp. 69-70)

The Belgrade Charter

A Global Framework for Environmental Education

A. Environmental Situation

Our generation has witnessed unprecedented economic growth and technological progress which, while bringing benefits to many people, have also caused severe social and environmental consequences. Inequality between the poor and the rich among nations and within nations is growing and there is evidence of increasing deterioration of the physical environment in some forms on a world-wide scale. This condition, though primarily caused by a relatively small number of nations, affects all of humanity.

The recent United Nations Declaration for a New International Economic Order calls for a new concept of development - one which takes into account the satisfaction of the needs and wants of every citizen of the earth, of the pluralism of societies and of the balance and harmony between humanity and the environment. What is being called for is the eradication of the basic causes of poverty, hunger, illiteracy, pollution, exploitation and domination. The previous pattern of dealing with these crucial problems on a fragmentary basis is no longer workable.

It is absolutely vital that the world's citizens insist upon measures that will support the kind of economic growth which will not have harmful repercussions on people; that will not in any way diminish their environment and their living conditions. It is necessary to find other ways to ensure that no nation should grow

or develop at the expense of another nation and that the consumption of no individual should be increased at the expense of other individuals. The resources of the world should be developed in ways which will benefit all of humanity and provide the potential for raising the quality of life for everyone.

We need nothing short of a new global ethic - an ethic which espouses attitudes and behaviour for individuals and societies which are consonant with humanity's place within the biosphere; which recognizes and sensitively responds to the complex and ever-changing relationships between humanity and nature and between people. Significant changes must occur in all of the world's nations to assure the kind of rational development which will be guided by this new global ideal - changes which will be directed towards an equitable distribution of the world's resources and more fairly satisfy the needs of all peoples. This new kind of development will also require the maximum reduction in harmful effects on the environment, the utilization of waste material for productive purposes, and the design of technologies which will enable such objectives to be achieved. Above all, it will demand the assurance of perpetual peace through coexistence and cooperation among nations with different social systems. Substantial resources for reallocation to meet human needs can be gained through restricting military budgets and reducing competition in the manufacture of arms. Disarmament should be the ultimate goal.

These new approaches to the development and improvement of the environment call for a reordering of national and regional priorities. Those policies aimed at maximizing economic output without regard to its consequences on society and on the resources available for improving the quality of life must be questioned.

Before this changing of priorities can be achieved, millions of individuals will themselves need to adjust their own priorities and assume a personal and individualized global ethic - and reflect in all of their behaviour a commitment to the improvement of the quality of the environment and of life for the world's people.

The reform of educational processes and systems is central to the building of this new development ethic and world economic order. Government and policy-makers can order changes, and new development approaches can begin to improve the world's condition - but all of these are no more than short-term solutions, unless the youth of the world receives a new kind of education. This will require new and productive relationships between schools and communities, between students and teachers, and between the education system and society at large.

Recommendation 96 of the Stockholm Conference on the Human Environment called for the development of environmental education as one of the most critical elements of an all-out attack on the world's environmental crisis. This new environmental education must be broad based on strongly related to the basic principles outlined in the United Nations Declaration on the New International Economic Order.

It is within this context that the foundations must be laid for a world-wide environmental education programme that will make it possible to develop new knowledge and skills, values and attitudes, in a drive towards a better quality of environment and, indeed, towards a higher quality of life for present and future generations living within that environment.

B. Environmental Goal

The goal of environmental action is:

To improve all ecological relationships, including the relationship of humanity with nature and people with each other.

There are, thus, two preliminary objectives:

1. For each nation, according to its culture, to clarify for itself the meaning of such basic concepts as "quality of life" and "human happiness" in the context of the total environment, with an extension of the clarification and appreciation to other cultures, beyond one's own national boundaries.

2. To identify which actions will ensure the preservation and improvement of humanity's potentials and develop social and individual well-being in harmony with the biophysical and man-made environment.

C. Environmental Education Goal

The goal of environmental education is:

To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

D. Environmental Education Objectives

The objectives of environmental education are;

1. Awareness: to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems.

2. Knowledge: to help individuals and groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.

3. Attitude: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.

4. Skills: to help individuals and social groups acquire the skills for solving environmental problems.

5. Evaluation ability: to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, esthetic and educational factors.

6. Participation: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve these problems.

E. Audiences

The principal audience of environmental education is the general public. Within the global frame, the major categories are:

1. The formal education sector: including pre-school, primary, secondary and higher education students as well as teachers and environmental professionals in training and retraining.

2. The non-formal education sector: including youth and adults, individually or collectively, from all segments of the population, such as the family, workers, managers and decision-makers, in environmental as well as non-environmental fields.

F. Guiding Principles of Environmental Education Programmes

The guiding principles of environmental education are:

1. Environmental education should consider the environment in its totality - natural and man-made, ecological, political, economic, technological, social, legislative, cultural and esthetic.
2. Environmental education should be a continuous life-long process, both in-school and out-of-school.
3. Environmental education should be inter-disciplinary in its approach.
4. Environmental education should emphasise active participation in preventing and solving environmental problems.
5. Environmental education should examine major environmental issues from a world point of view, while paying due regard to regional differences.
6. Environmental education should focus on current and future environmental situations.
7. Environmental education should examine all development and growth from an environmental perspective.
8. Environmental education should promote the value and necessity of local, national and international cooperation in the solution of environmental problems.

Appendix III

Constitution of Students' Executive Council, Melbourne Church of England Girls' Grammar School

(Quoted from K. S. Cunningham and D. J. Ross, An Australian School
at Work, Australian Council for Educational Research, Melbourne,
1967)

After being constantly under review the constitution of the executive council at MCEGGS at the end of ten years was as set out below.

CONSTITUTION

1. Membership

- a. The headmistress and five members of staff elected by the staff. One at least of these must be from the junior secondary school. Each year there must be some change in the staff representatives on the council.
- b. Presidents of major clubs.
- c. President of the minor clubs' committee and presidents of all committees set up by the council, and such other members of these committees as the council may decide.
- d. Captain of the boarding house.
- e. Form captains of each fifth and sixth form. These must change at half-year. After the half-year elections the council shall consider the positions of form captains who have not been elected to the council in another capacity. The council shall have the power to co-opt any or all of these to the council, if it is considered that they will be valuable members in helping the council in its discussions or other sides of its work. Two-thirds of the council voting must be in favour. No new member of the council shall be

eligible to take part in this election for cooption.

f. Captains of major teams. The sports' committee decides which are major teams.

2. Quorum

A quorum shall consist of two-thirds of the total number of the council and no business shall be transacted unless a quorum is present.

3. Elections

a. Elections shall be held twice a year. All members shall retire before an election, except the president and vice-president of the council.

b. All voting shall be by secret ballot.

c. There shall be no absentee or postal voting.

d. Girls new to the school shall have no vote and shall not be eligible for election until they have been in the school for one and a half terms.

e. No girl is eligible for election to the council until she has been at least one and a half terms in a fifth or sixth form (except captains of fifth forms).

f. The council shall decide who is eligible to vote at the various elections.

g. The council shall appoint a sub-committee to conduct the elections. The convenor of this sub-committee shall be the president of the council and she shall be the returning officer for the election. The sub-committee shall make all the necessary arrangements for the holding of the elections subject to the approval of the council.

4. Meetings

The council shall hold at least four ordinary meetings a term. An extraordinary meeting for emergency business may be held at any time

shall be the secretary of the council.

b. The secretary shall conduct and record the correspondence of the council, and shall give notice of meetings, receive suggestions from forms, and with the assistance of the minutes secretary, prepare and issue a bulletin after the meeting. She shall also prepare the agenda for the meeting and carry out any duties decided upon by the council.

iii. Minutes Secretary

a. The secretary of the General Activities and Commercial Committee shall be elected from the commercial members and shall be on the council and shall be the minutes secretary of the council.

b. The minutes secretary shall enter the minutes of all council meetings in the minutes book, and help prepare the bulletin. At the end of each half-year she shall make a summary of all suggestions passed by the council in that time.

iv. Treasurer

a. The treasurer of the Social Services Committee shall be on the council and shall be the treasurer of the council.

b. The treasurer works with the member of the bursar's staff in charge of the Pupils' Activities Account.

c. The treasurer shall report to the council meetings all money collected from the school from various funds and shall report on how it has been expended. This report shall be included in the council bulletin.

d. Every group in the school which collects money must appoint a treasurer who must report to the council treasurer and obtain her advice and assistance in the keeping of accounts. The council treasurer shall be responsible for seeing that this is done in an orderly fashion.

7. Powers and Duties

The powers of the council are partly self-governing, partly advisory and partly disciplinary.

i. Self-governing (no veto by the head)

to make and alter laws concerning elections to the council and committees, except where an educational principle is involved;

to organize the following:

arrangements for going to and from assembly, together with

seating in the hall;

cloakrooms and pound;

order and general assistance in the tuck-shop;

improvements to school activities;

general orderliness and tidiness;

clubs and committees;

to decide on the best methods to help girls keep laws and organization routine.

ii. Advisory (subject to veto)

Any school matter may be brought before the council and discussed and voted on, but the head has a veto on the following:

a. questions involving financial outlay;

b. questions involving religion and religious observances;

c. questions involving health;

d. matters for expert educational consideration, e.g. curriculum, behaviour problems.

Requests on these matters may go to the head in the form of a request.

iii. Disciplinary Powers

Councillors may deal with matters of discipline themselves or

report the matter to the form mistress, the council or the head. The aim of councillors should be to help girls keep the laws and observances. If a councillor takes action herself to deal with any matter of discipline, she shall inform the president of what has been done. Only on the advice of the head should a girl be brought before the council.

iv. The council may set up a committee for any school activity as is required, and may set up sub-committees needed for a particular purpose, and may decide how these shall be elected. Members of council sub-committees need not be members of the council, but the convenors of these sub-committees must be members of the council. There must be a staff member on each committee and sub-committee, and the president and head shall have the right to attend all meetings.

8. Amendments

If an amendment to the constitution is proposed at a council meeting, the matter may be discussed, but voting must be postponed to the next meeting. Between these meetings the matter may not be discussed with the school. If passed by two-thirds of the council present, a referendum must be held among fifth and sixth years and staff before the next council meeting. If it passed by a majority vote in the referendum the amendment is adopted.

COUNCIL PROCEDURE

These rules can be altered by the council itself.

1. Council meetings shall open with the council prayer.
2. The first meeting of the year shall be held on the afternoon of the first school day of the year.
3. Form meetings shall be held before council meetings and the proposals go to the council secretary by the Friday preceding the

council meeting.

4. It is the duty of the secretary to prepare a bulletin each meeting. A copy of this shall be posted on the council notice board and given to each staff and form representative, who will then explain it to the group she represents. Matters not included in the bulletins should not be discussed with non-council members. No Council business shall be disclosed before the bulletin is read. Councillors who are not form representatives will explain the bulletin to first, second, third and fourth years. The head or president shall be asked to explain matters of importance to the school as a whole if this is felt to be necessary by the council.

5. Each third and fourth year form may send a representative to bring up matters for her form, if it has been passed by a majority of the form. She should attend only for the form business and she has no vote.

6. The Junior Secondary School Committee may also send representatives to the council if they wish to bring up matters for their group.

7. Visitors from within or outside the school may be invited to watch a meeting at the discretion of the head and the president of the council.

8. The president shall arrange an informal weekly meeting of the girls on the council to arrange duties for the week. No council business may be discussed at this meeting.

9. A list of absentees in fifth and sixth forms shall be collected by the general activities' president from the school secretary each morning and shall be posted in the council room so that arrangements may be made for attending to the duties of absent

council and committee members.

COUNCIL REGULATIONS

These regulations may be altered by the council itself.

1. Councillors should not be form vice-captains and preferably should not hold office in forms.
2. Councillors should not be on more than one committee except in an ex-officio capacity. Members of the Sports' Committee are all considered to be ex-officio but with a vote.
3. After the mid-year election the council shall appoint a sub-committee for making up the school diary.
4. These^{are} regulations concerning committees set up by the council:
 - a. The council shall decide the numbers, the franchise, and the methods of voting for each committee.
 - b. A committee shall have the right to draw up its own constitution, subject to the above clause, but must submit this and any later amendments to the council for approval.
 - c. Each committee shall elect a president and secretary and any other office-bearers required. The president shall be the convenor and the secretary shall keep minutes and help the president prepare a report to present to the council at each reports' meeting.
 - d. The committees may not do anything which is contrary to the general principles of the council.
 - e. The staff shall be represented on each committee.
 - f. Girls on the committees must be fifth or sixth years at the time of election or cooption to the committee.
 - g. On all committees except the Sports' Committee more than half the members must be girls who are not councillors at the

time of the election. If it is found that there are too many councillors on any committee, then a sufficient number must resign to comply with this regulation. The Election Subcommittee shall have the power to decide how the vacancies shall be filled.

- h. Girls who are not councillors may be on two committees if they can fill both positions satisfactorily. The committee shall decide this.
- i. The head and the president shall have the right to attend and vote at committee meetings.
- j. If a member misses two meetings without a good and sufficient reason, then she automatically ceases to be a member of the committee, and the committee has the power to fill the position. The committee shall decide on what is a good and sufficient reason for absence.
- k. All committees shall have the power to coopt not more than three members if required.

SCHOOL CLUBS

Any group of girls wishing to form a club may apply to the Minor Clubs' Committee for permission to do so. All clubs must elect a committee and office-bearers, and minor clubs shall elect two representatives to the Minor Clubs' Committee, and send reports to the Minor Clubs' Committee meetings. The Minor Clubs' Committee shall elect its own office-bearers and the president of this committee shall be on the council to represent the committee. The presidents of major clubs shall be on the council. Major clubs are those which have more than twenty members and which are firmly established. Any minor club which fulfils these conditions may apply to the council to be recognized as a major club.

BIBLIOGRAPHYA. BOOKS

Armstrong, W. H. G., Four Hundred Years of English Education, Methuen, London, 1973

Asimov I., A Choice of Catastrophes, Hutchinson, London, 1980

----- Biographical Encyclopedia of Science and Technology,
Pan Books, London, revised edition, 1972

Beck R. H., A Social History of Education, Prentice-Hall, N.J., 1965

Beer S., Platform for Change, John Wiley & Sons, London, 1975

Bell D., The Coming of the Post-Industrial Society, Penguin, Middlesex, 1976

Bible, The; King James Version

Blackstone W. T., Philosophy and Environmental Crisis, University of Georgia Press, Athens (USA), 1974

Bockris J. O'M. (ed), Environmental Chemistry, Plenum Press, N.Y., 1978

Boorstein E., Allende's Chile, International Publishers, N.Y., 1975

Botkin J. et al, No Limits to Learning. Bridging the Human Gap.
Report to the Club of Rome, Pergamon Press, Oxford, 1979

Boyd W. (ed), Émile for Today. The Émile of Jean Jacques Rousseau,
Heinemann, London, 1963 reprint

Brubacher J. S., A History of the Problems of Education, Macmillan,
N. Y., 2nd. ed., 1969

Cary M. and Haarhoff T. J., Life and Thought in the Greek and Roman World, University Paperbacks, Methuen, London, 1968 reprint

Childe G., What Happened in History, Penguin, Middlesex, 1946 reprint

Clarke R. C., Technological Terrorism, The Devin Adair Co., Old Greenwich, Conn., 1980

Cleverly J. and Phillips C. D., From Locke to Spock, Melbourne University Press, Carlton, Vic., 1976

Cohen S. (ed), Education in the United States. A Documentary History
Vol. 2, Random House, N.Y., 1974

Combs A. W., Myths in Education, Allyn & Bacon, Boston, 1979

Commings S. and Linscott R. (eds), Man and the State: The Political Philosophers, The Pocket Library, Random House, N.Y., 1954

- Cross N. et al (eds), Man-Made Futures, Hutchinson Educational and Open University Press, London, 1974
- Cunningham K. S. (ed), Education for Complete Living, Australian Council for Educational Research, Melbourne, 1938
- Cunningham K. S. and Ross D. J., An Australian School at Work, Australian Council for Educational Research, Hawthorn, Vic., 1967
- Daly H. E. (ed), Towards a Steady-State Economy, W. H. Freeman, San Francisco, 1973
- Deakin University, Liberation and Control, Melbourne, 1979
- Dickens C., Hard Times, Penguin, Middlesex, 1969
- Editors of The Ecologist, A Blueprint for Survival, Penguin, Middlesex, 1972
- Enwistle H., Antonio Gramsci. Conservative Schooling for Radical Politics, Routledge & Kegan Paul, London, 1979
- Evans J. and Boyden S (eds), Education and the Environmental Crisis, Australian Academy of Science, Canberra, 1970
- Farrington B., Greek Science. Its Meaning for Us, Penguin, Middlesex, 1944
- Fensham P., A Report on the Belgrade Conference on Environmental Education, Curriculum Development Centre, Canberra, 1976
- Friends of the Earth, The Stockholm Conference. Only One Earth, Earth Island Ltd., London, 1972
- Galbraith J. K., Economics and the Public Purpose, Penguin, Middlesex, 1975
- Gentile G., The Reform of Education, trans. D. Bigongiara, Harcourt Brace, N.Y., 1922
- Gibbon E., The Decline and Fall of the Roman Empire, Vol. I, Everyman's Library, J. M. Dent & Sons, London, 1914 reprint
- Gill R. T. (ed), Economics: A Text With Included Reading, Goodyear Publishing Co., California, 1973
- Good H. G., A History of Western Education, Macmillan, 2nd. ed., N.Y., 1969
- Gordon P. and White J., Philosophers as Educational Reformers, Routledge & Kegan Paul, London, 1979
- Hammond J. L. and Hammond B., The Town Labourer 1760-1832 Vol. II, Guild Books, The British Publishers Guild Ltd., London, 1949

- Helfrich H.W. (ed), The Environmental Crisis, Yale University Press, New Haven, 1970
- Hobhouse L.T., The Metaphysical Theory of the State, George Allen & Unwin, London, 6th. imp., 1960
- Hogben L., Science for the Citizen, George Allen & Unwin, London, London, 2nd. ed., 4th. impression, 1943
- Holden J.P. and Erlich P. (eds), Global Ecology, Harcourt Brand & Jovanovich, N.Y., 1971
- Hughes-Evans D (ed), Environmental Education: Key Issues for the Future, Pergamon Press, Oxford, 1977
- Huxley A., Brave New World, Penguin, Middlesex, 1966 reprint
- Jungk R., The Nuclear State, trans. E. Mosbacher, John Calder, London, 1979
- Kahl J., The Misery of Christianity, Penguin, Middlesex, 1972 reprint
- Keller E.A., Environmental Geology, Chas. E. Merrill Publishing Co., Columbus, Ohio, 2nd. ed., 1979
- Koestler A., The Ghost in the Machine, Hutchinson, London, 1976
- The Sleepwalkers, Penguin, Middlesex, 1964
- Laski H., Liberty in the Modern State, Penguin, Middlesex, 1937
- Lawson J. and Silver H., A Social History of Education in England, Methuen, London, 1973
- Leontief A. et al, The Future of the World Economy: A United Nations Study, Oxford University Press, N.Y., 1977
- Lindsay J., A Short History of Culture from Prehistory to the Renaissance, Studio Books, Longacre Press, London, 1962
- Linke R.D., Environmental Education in Australia, George Allen & Unwin, Sydney, 1980
- McCann P. (ed), Popular Education and Socialization in the Nineteenth Century, Methuen, London, 1977
- Marler C.D., Philosophy and Schooling, Allyn & Bacon, Boston, 1975
- Meadows D. et al, The Limits to Growth, Pan Books, London, 1975
- Montague A., The Nature of Human Aggression, Oxford University Press, N.Y., 1976
- (ed), Man and Aggression, Oxford University Press, N.Y., 2nd. ed., 1973
- Nader R. and Abbotts J., The Menace of Atomic Energy, Outback Press, Victoria, 1977

- Olson M. and Landsberg H., The No-Growth Society, Woburn Press, London, 1975
- Orwell G., Animal Farm, Penguin, Middlesex, 1963 reprint
- Parkes B. (ed), Mellor's Modern Inorganic Chemistry, Longmans, London, revised ed., 1963
- Pearl A., The Atrocity of Education, New Critics Press, St. Louis, Missouri, 1972
- Petras J. and Morley M., The United States in Chile, Monthly Review Press, N.Y., 1975
- Plato, The Republic, trans. H. P. D. Lee, Penguin, Middlesex, 1971 reissue
- Timaeus and Critias, trans. H. P. D. Lee, Penguin, Middlesex, 1971 reissue
- Popper K. R., The Open Society and its Enemies. Vol. I: The Spell of Plato, Routledge & Kegan Paul, London, 4th. ed., rev., 1962
- Power E. J., Main Currents in the History of Education, McGraw Hill, N.Y., 1962
- Randall H., The Creative Centuries. A Study in Historical Development, Longmans Green & Co., London, 1947
- Reinecke I., Micro Invaders, Penguin, Ringwood, Melbourne, 1982
- Renan E., The Life of Jesus, Thinkers' Library, London, 1935
- Rifkin J., Entropy, The Viking Press, N.Y., 1980
- Roxborough I. et al, Chile, The State and Revolution, Macmillan, London, 1977
- Runes D. D., Dictionary of Philosophy, Littlefield Adams, N. J., 1966 reprint
- Russell B., Has Man a Future?, Allen & Unwin, London, 1961
- Sagan C., Cosmos, Macdonald Future Publishers, London, 1981 reprint
- Sambursky S., The Physical World of the Greeks, trans. M. Dagut, Routledge & Kegan Paul, London, 1956
- Schools Council, Project Environment. Education for the Environment, Longman, London, 1974
- Schwartz E. S., Overskill, Quadrangle Books, Chicago, 1971
- Stevenson L., Seven Theories of Human Nature, Oxford University Press, N.Y., 1974

- Stumpf S. W., Socrates to Sartre. A History of Philosophy, McGraw Hill, N.Y., 1966
- Sylvester D. W. (ed), Educational Documents 800-1816, Methuen, London, 1970
- United States Office of Education, Education in England, U.S.O.E., Washington, D. C., 1960
- Wales J. N., Prologue to Education, Routledge & Kegan Paul, London, 1979
- Ward B. and Dubos R., Only One Earth, Deutsch, London, 1972
- Watkins B. O. and Meador R., Technology and Human Values, Ann Arbor Science Publishers Inc., Michigan, 1978
- Wiezenbaum J., Computer Power and Human Reason, Freeman, San Francisco, 1976
- Wingo G. M., The Philosophy of American Education, Heath & Co., Boston, 1965
- Witt P. (ed), Technology and the Curriculum, Teachers' College Press, Columbia, 1967
- Yablonsky L., Robopaths, Penguin, Middlesex, 1973 reprint.

B. JOURNALS AND PAPERS

- Australian Conservation Foundation Occasional Paper No. 9, Melbourne, June 1972
- Australian Council for Educational Research, Education Review No. 16, Where Junior Secondary Schools Are Heading, Hawthorn, Victoria, 1982
- Australian Journal of Social Issues, Vol. 14 No. 2, May 1979
- Australian Treasury Paper No. 2, Economic Growth: Is It Worth Having?, Australian Government Publishing Service, Canberra, 1973
- Board of Senior School Studies, Economics and Society Syllabus, Years 11 and 12, New South Wales Department of Education, Sydney, 1970
- Department of Home Affairs and Environment, National Conservation Strategy for Australia: Towards a National Conservation Strategy: A Discussion Paper, Australian Government Publishing Service, Canberra, 1982
- Educational Theory, Vol. 25 No. 1, Winter 1975

Harvard Educational Review, Vol. 39 No. 1, Winter 1969

----- Vol. 39 No. 2, Spring 1969

Myers R. (chairman), Committee of Inquiry into Technological Change in Australia. Report, Australian Government Publishing Service, Canberra, 1980

National Outlook, Vol. 2 No. 11, November 1980

New Scientist, Vol. 69 No. 983, January 1976

New South Teachers' Federation, Education, Vol. 63 No. 14, August 16 1982

Past and Present, No. 42

The Ecologist, Vol. 2 No. 7, July 1972

The Journal of the History of Education Society, Vol. 6 No. 2, 1977

Vestes. The Australian Universities Review, Vol. 22 No.2, 1979

Williams B. (chairman), Report of the Committee of Inquiry into Education and Training, 3 vols., Australian Government Publishing Service, Canberra, 1979

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